

# **FINAL ENVIRONMENTAL ASSESSMENT**

## **FLOODPLAIN HABITAT RESTORATION AT THUNDER RANCH, UTAH**

**Prepared by**

**Bureau of Reclamation  
Western Colorado Area Office  
Grand Junction, Colorado**

**for**

**Upper Colorado River Endangered Fish Recovery Program  
Denver, CO**

**April 2004**



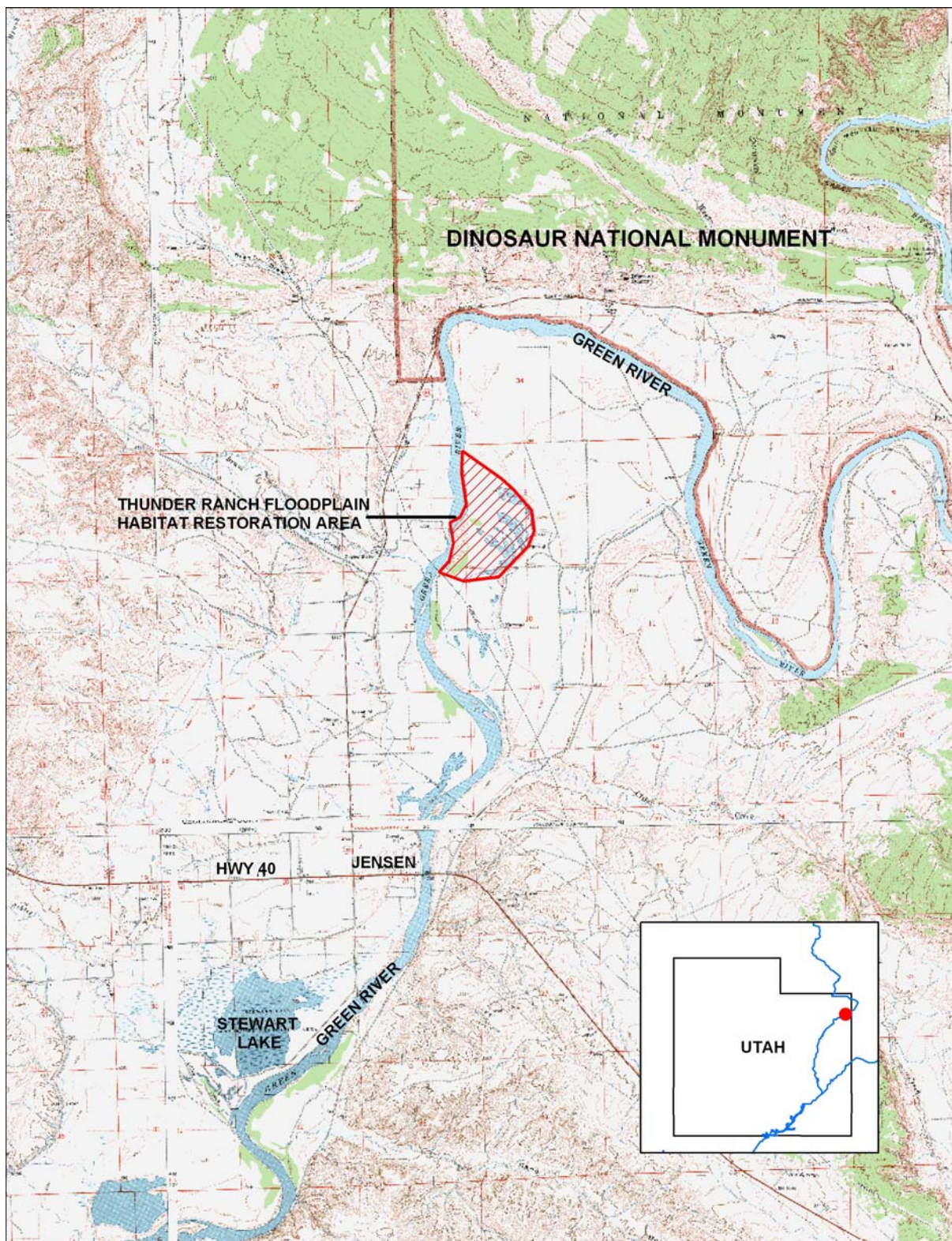


Figure 1-Locator Map

---

## TABLE OF CONTENTS

CHAPTER 1 – INTRODUCTION .....	1
Proposed Action.....	1
Need for and Purpose of Action.....	1
Upper Colorado River Basin Endangered Fish Recovery Program.....	2
Background Information.....	4
Thunder Ranch.....	4
Water Quality Issues .....	4
CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES.....	5
No Action Alternative.....	5
Proposed Action.....	5
Other Alternatives Considered:.....	7
CHAPTER 3 – AFFECTED ENVIRONMENT AND .....	9
ENVIRONMENTAL CONSEQUENCES .....	9
General.....	9
Land Use and Recreation .....	10
Vegetation .....	11
Riparian Community.....	11
Bottomland Pond and Wetland Community .....	11
Fish and Wildlife Resources .....	13
Fisheries .....	13
Avian Species.....	14
Mammals.....	15
Amphibians and Reptiles .....	15
Threatened and Endangered Species .....	16
Endangered Fishes .....	16
Bald Eagle.....	21
Western Yellow-billed Cuckoo.....	22
Clay Reed-Mustard .....	24
Uinta Basin Hookless Cactus.....	24
Ute Ladies’ -Tresses .....	25
Section 7 Consultation Summary.....	27
Water Quality.....	29
Selenium & Contaminant Levels.....	29
Water Rights .....	32
Historical and Cultural Resource Properties.....	33
Indian Trust Assets .....	33
Environmental Justice.....	34
Health and Safety/Disease Vectors.....	34
Socioeconomic .....	35
Cumulative Impacts .....	35
Summary and Environmental Commitments.....	35

CHAPTER 4 – CONSULTATION AND COORDINATION .....	37
General.....	37
Distribution List.....	37
REFERENCES .....	38
APPENDIX A-Distribution Mailing List	
APPENDIX B-Thunder Ranch Bottomland Aerial Photo Site Plan	
APPENDIX C-Comment Letters and Responses on the Draft EA	
APPENDIX D-Biological Opinion	

### **List of Figures**

Figure 1-Locator Map.....	ii
Figure 2-Thunder Ranch Bottomlands.....	1
Figure 3-Proposed Plan.....	8
Figure 4-Thunder Ranch Bottomland Selenium Levels .....	32

### **List of Tables**

Table 1-Nonnative and Native Fish Species in the Project Area.....	13
Table 2-Summary of Effects to Threatened, Endangered and Candidate Species in the Project Area.....	26
Table 3-Selenium Data Summary for the Thunder Ranch Bottomlands .....	30



## CHAPTER 1 – INTRODUCTION

---

### **Proposed Action**

The Upper Colorado River Endangered Fish Recovery Program (Recovery Program) is proposing to restore endangered fish habitat at 330 acres of Green River bottomlands located on the Thunder Ranch near Jensen, Utah. The Recovery Program acquired a total of 455 acres of easement from Thunder Ranch to protect and improve floodplain habitat for the benefit of endangered Colorado River fishes. The project area is located adjacent to the Green River within an old meander river channel. Several ponds and wetlands exist in the project area, but are isolated from the Green River by an earth-filled levee. By notching the existing levee that separates the ponds from the Green River, the proposed action would allow endangered fish larvae to drift from the river into the ponds and use the ponds as a nursery habitat. An active razorback sucker spawning site is located several river miles upstream of the project area. Sub-adult and adult razorback sucker and Colorado pikeminnow would also benefit with access to additional habitat.



Figure 2-Thunder Ranch Bottomlands

### **Need for and Purpose of Action**

This Draft Environmental Assessment (EA) evaluates effects on the human environment from notching the earthen levee to entrain endangered fish larvae into ponds located on the Thunder Ranch adjacent to the Green River. The property is located in Uintah County, near Jensen, Utah and is owned by Thunder Ranch, L.L.C (Frontispiece Map). The Bureau of Reclamation (Reclamation) prepared this EA in cooperation with the U.S. Fish and Wildlife Service (Service) and other federal and state agencies to comply with the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), and related U.S. Department of the Interior policies and regulations. This report is intended to serve as a Biological Assessment prepared under Section 7 of ESA. If, based on this analysis, Reclamation concludes the proposed action would have no significant impact on the human environment, preparation of an Environmental Impact Statement would not be required.

**Need:** The loss of floodplain habitat is a factor that has contributed to the decline of the endangered fishes of the Upper Colorado River Basin. To reverse this trend, the Recovery Program seeks opportunities to restore, enhance, and protect floodplain habitats that will support recovery of the species.

#### Upper Colorado River Basin Endangered Fish Recovery Program

In 1988, the Governors of Colorado, Utah and Wyoming; the Secretary of the Interior; and the Administrator of Western Area Power Administration entered into a cooperative agreement to initiate the Recovery Program. The Recovery Program is a cooperative partnership involving Federal and State agencies, environmental groups and water and power user organizations. Pursuant to the Endangered Species Act of 1973 (16 USC 1531 et seq.), the Recovery Program seeks to recover four species of endangered fish (Colorado pikeminnow, razorback sucker, humpback chub, and bonytail) while water development proceeds in accordance with Federal and State laws. Recovery is defined as achieving and maintaining natural self-sustaining populations of the species.

Recovery Program elements include:

- Habitat management including identifying and acquiring instream flows, changing operations of Federal dams, and operating other reservoirs in a coordinated manner to benefit endangered fish.
- Habitat development including restoring floodplain/wetland habitats, constructing fish passageways around dams and other barriers in the river, and installing screens to prevent entrainment of endangered fish into diversion canals.
- Native fish propagation and genetic management involving establishing facilities to hold adult brood stock to prevent extinction of these rare fish and maintain their genetic resources; develop grow-out ponds; conduct research to improve survival of endangered fish raised in captivity and stocked in the wild; and support appropriate stocking and reintroduction efforts.
- Nonnative species and sport fishing entailing managing detrimental nonnative fish species in habitat considered “critical” to endangered fish. This also involves educating and distributing information to anglers to reduce accidental capture of endangered fish.

- 
- Research, monitoring and data management provides information about what these fish need to survive, grow, and reproduce in the wild. Efforts include compiling data on the number, sizes, and locations of endangered fish; monitoring endangered fish population trends; and making river flow recommendations.

The razorback sucker is one of four species of Colorado River fishes that are in danger of becoming extinct. This species in particular is dependant upon floodplain habitat to ensure its survival and recovery. Razorback suckers spawn on the ascending limb of the hydrograph during spring runoff. After eggs hatch, larvae begin to drift downstream. Larvae that drift into floodplain wetlands have a better chance of survival than those that remain in the main channel. Floodplain wetlands have warmer water temperatures, resulting in greater food production and faster growth rates for young fishes, thereby increasing the chances of survival because larger fish are less vulnerable to predation. Floodplain habitats also provide a quiet-water shelter from main channel river currents, which reduces energy expenditure that can be used for growth. Inundated wetland vegetation also offers hiding places for avoiding predators.

Construction of large reservoirs that reduce high spring river flows and the construction of levees have disconnected many floodplain wetlands from the main river channel, thereby denying access to larvae that are drifting down the river. Without access to these nursery habitats, few larvae are able to survive. The river environment is harsh compared to the floodplain wetland environment. Water temperatures are colder, food is relatively scarce, and there is no cover available to escape predation.

The proposed action will construct a series of notches in the levee that isolates the Thunder Ranch bottomlands from the Green River. This will allow a portion of the Green River to flow through the property during spring runoff to fill the ponds and provide a seasonal connection between the ponds and the Green River. Some of the razorback sucker larvae drifting downriver at this time of year would become entrained in the ponds. The ponds provide important nursery habitat that may help prevent the extinction of this species.

**Purpose:** The purpose of the proposed action is to facilitate entrainment of drifting razorback sucker larvae into the Thunder Ranch bottomland ponds. In these types of environments, larvae are able to survive and grow until they are ready to leave for the river to join the adult population. Without these types of habitats, few razorback sucker larvae are able to survive. In addition, adult razorback sucker and Colorado pikeminnow will benefit with access to additional habitat.

## **Background Information**

### **Thunder Ranch**

The Thunder Ranch is located approximately 3 miles northeast of Jensen, Utah in Uintah County. Thunder Ranch encompasses approximately 2,000 acres and is used primarily for ranching. Center pivot irrigation systems are used to irrigate large pastures above the project area. The Ranch is located adjacent to the Green River and downstream of Dinosaur National Monument (Frontispiece Map). The Recovery Program acquired an easement on 455 acres of floodplain bottomland from Thunder Ranch in 2003 for the purpose of protecting and enhancing endangered fish habitat. The easement allows for increasing the frequency of connection to the bottomland site. Additional water impoundment is not permitted under the easement conditions.

The project area provides wildlife habitat for numerous avian species including neo-tropical migrants. The ponds, wetlands, and bottomlands associated with Thunder Ranch are important for migrating waterfowl. Elk, deer and turkey also use the project area.

### **Water Quality Issues**

Elevated selenium levels from springs and seeps which enter the Thunder Ranch bottomland site may have detrimental effects on water quality and area wildlife. The Utah standard for selenium is 4.6 parts per billion (ppb). Springs and seeps associated with irrigation returns have been documented in the 2,000 ppb range. Ponds and wetlands within the project area have selenium concentrations in the general range of 4 to 10 ppb.



---

## CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

---

Alternatives evaluated in this environmental assessment include No Action and the Proposed Action.

**No Action Alternative:** Under the No Action Alternative, the Recovery Program would not take action to enhance endangered fish habitat at Thunder Ranch. Notches to entrain larval razorback sucker would not be constructed in the existing levee.

**Proposed Action:** Tetra Tech Inc. of Breckenridge, Colorado was contracted by the Recovery Program to develop a habitat restoration plan for Thunder Ranch (Tetra Tech Inc., 2003). Survey data used to design the restoration plan were collected in 1993 as described in a report entitled “*Green River Razorback Sucker Spawning Reach, Hydrologic Study near Jensen, Utah*” (Flow Engineering, Inc., 1993). The primary focus of the study was to investigate the hydraulic conditions and channel geometry changes at a large cobble bar which splits the river several miles upstream of the Jensen Bridge. As a compliment to the spawning bar investigations, additional hydrographic data was collected in a reach of the Green River near a series of abandoned meander bends downstream of Dinosaur National Monument. River cross sections were surveyed to predict overbank flows into the project area.

Tetra Tech, Inc. developed a habitat restoration plan to seasonally flood the project area with a frequency of the 1.25 to 2.0 year flow event (12,000-16,900 cfs) (Figure 3). An existing levee separates the wetlands and adjoining bottomlands from the Green River. The restoration plan calls for a series of seven notches in the levee to allow flows above 12,000-16,900 cfs to flood the project area. This would require some local floodplain shaping of higher ground behind the levee.

Two-dry wells, pits dug into the alluvium separated from the river by the levee, will be formed; each to supply a constructed refreshing flow channel that would provide limited flows to the bottomland with river discharges greater than 7,500 cfs. The purpose of the refreshing channels is to supply water to the wetlands when the runoff does not reach the inundation notches. This “fresh” water supply would improve the bottomland habitat in years when the river does not connect to notches designed to capture larval fish. The diversion for the freshening flows will be from constructed depressions, or dry wells. As the river rises, these dry wells would fill with groundwater, thus supplying smaller amounts of water for longer periods compared to the levee notches. The freshening flow channels are approximately 3 feet wide.

An outlet channel will also be constructed to provide flow through conditions for the bottomland. The outlet channel will be 700 feet long and 30 feet wide with riprap stabilizing the channel invert and grade in two locations. Natural vegetation will also be established for bank stabilization at the river confluence. The outlet invert is at an elevation of 4,731.7 feet to maximize ponding depths and slopes to 4,729.7 feet near the river’s edge based on minimizing

---

hydraulic forces at the outlet. The flow through condition would maximize the amount of drifting larvae that can be entrained in the bottomland during river connection.

A majority of the seeps are of poor water quality and have elevated selenium levels. The seeps occur in the middle of the bluff slope and run on or near the slope surface to the ponds. The groundwater seeps at Thunder Ranch are perennial and represent a perched aquifer. A seep collection system will be constructed along the eastern bluff of the bottomland to transport the seep water directly to the Green River to reduce selenium concentrations within the ponds and wetlands. The object of the seep collection system is to intercept waters with high selenium concentrations that run on the surface of the slope and to pipe them directly to the river without interaction with the ponded bottomland. Details of the seep collection system include: a gravel infiltration area; 100 feet of perforated pipe; 2,000 feet of conveyance pipe; access boxes; gates and controls; and a construction platform. To prevent floating of the conveyance pipe, anchors may be required where adequate burial is not possible. The outlet at the river will be fitted with a hinged gate to prevent high river flows from depositing sediments in the pipe and to prevent rodents from nesting in the pipe during low flow periods. A temporary construction platform may be required for heavy equipment access to the site. Construction activities would be preformed by Reclamation's Provo Area Office. Construction would begin in 2004 before or after spring runoff.

Suitable materials excavated from the levee notches will be utilized to repair an offset levee at the south end of the bottomland. The offset levee will be constructed at elevation 4,836 feet to provide flood protection equal to existing conditions. Acceptable material will be deposited in upland sites adjacent to the bottomlands in areas approved by Thunder Ranch. Other spoils may be deposited in upland areas adjacent to the excavation. To implement the proposed action, 9,700 cubic yards of material will be excavated; 3,600 cubic yards will be used to construct the offset levee; 260 cubic yards of rock and gravel will be imported; 224 square yards of filter fabric will be used; and approximately 6 acres will be within the construction limits. The project area will be incorporated into the National Wildlife Refuge system and the easement will be managed as a component of the Colorado River Wildlife Management Area with operations based at the Ouray National Wildlife Refuge near Vernal, Utah.

Evaluation, monitoring and the use of adaptive management by the Recovery Program will be incorporated as integral parts of the proposed action. Evaluation will consist of stocking hatchery-produced larval razorback sucker and bonytail into the wetlands, and monitoring survival and growth. Dissolved oxygen, pH, and temperature will be recorded hourly through a 24-hour period every week with a continuous recording device (hydrolab). In addition, recording thermometers will be installed. Turbidity will be measured once a week at the time hydrolab recorders begin recording and depth will be monitored weekly. If water quality degrades in any impoundment, the hydrolab will be deployed in that site to document severe changes for correlation in the event of an eventual fish-kill. If the wetlands begin to dry up such that water quality becomes a threat to survival of razorback sucker and bonytail, attempts will be made to capture fish and either stock them directly into the Green River or into available grow-out ponds (as determined by the Biology Committee of the Recovery Program).

---

Wetland vegetation will be monitored monthly with aerial photography. Total area of the wetland will be determined using GPS equipment and percent area of dominant vegetation will be determined by planimetry. Dominant vegetation types will be identified (i.e., dominant submergent, emergent, flooded terrestrial, etc.) and the percent area from overhead aerial photographs will be determined.

Fish composition and size structure (length frequency) will be monitored in each wetland shortly after initial inundation to determine relative abundance and composition of nonnatives; in mid-summer to determine the relative abundance or absence of stocked fishes; and in late September or early October to determine abundance of stocked fish and fish species composition in the wetland preceding the winter months. Each fish collection will consist of five fyke nets set overnight at randomly assigned shoreline sites. Species, weight, and length (TL) of all fish captured will be recorded. During the last fish collection, mark-recapture efforts will be attempted in each wetland to determine the absolute abundance of razorback sucker and bonytail at the end of the first field season (sampling not to exceed five net nights). Relative abundance of non-stocked fish will be determined in the fall.

Data will be analyzed to determine how nonnative fish abundance and composition, temperature, dissolved oxygen, pH, turbidity, depth, size of wetland, type and vegetation cover are associated with survival of both razorback sucker and bonytail in the wetlands studied. Razorback sucker and bonytail survival, growth and abundance (absolute and relative) will be regressed with environmental and biological parameters measured to identify causal relationships.

Monitoring of selenium and other water quality issues will be conducted and funded by the U.S. Fish and Wildlife Service to the extent deemed necessary by the Utah-ES office. Data and results of evaluation efforts will be shared between the Recovery Program and the Service.

### **Other Alternatives Considered:**

Several preliminary alternatives were considered for enhancing endangered fish habitat at Thunder Ranch. These included 1) increasing the inundation frequency in the south half of the bottomland only (157.6 acres) with an ideal inundation period, 2) increasing inundation frequency over the entire bottomland (291.1 acres) with inundation occurring only with discharges greater than the 2-year flow event of 16,900 cfs. These alternatives were eliminated from further consideration because they did not maximize potential benefits to the endangered fishes.

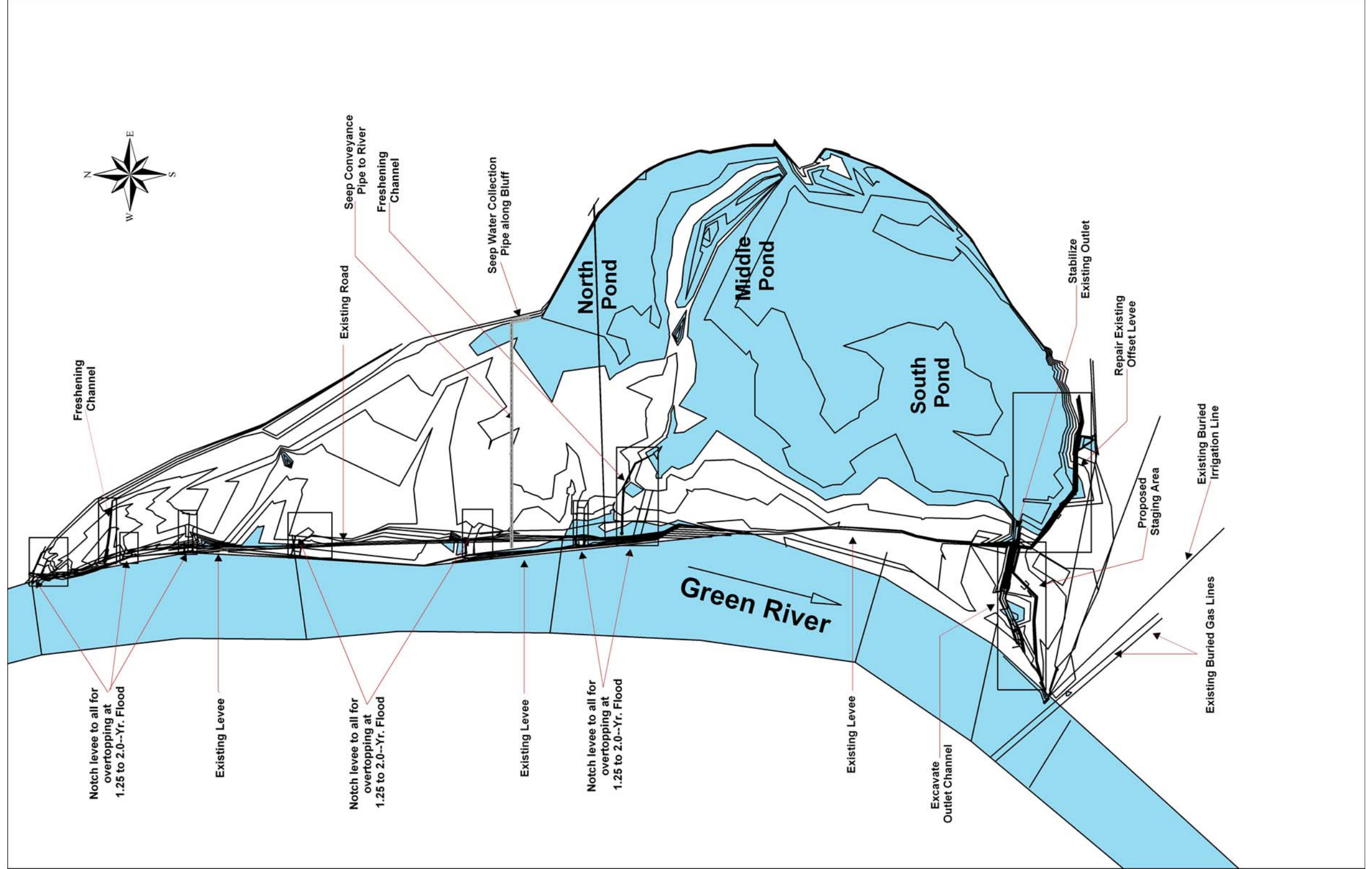


Figure 3-Proposed Plan

---

## **CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

---

### **General**

This chapter discusses resources that may be affected by the proposed action of notching the levee at the Thunder Ranch Bottomlands. During the preparation of this Draft EA, information on issues and concerns was received from project-area residents and easement holders, and the U.S. Fish and Wildlife Service (see Chapter 4, Consultation and Coordination, for further details).

For each resource, the potentially affected area and/or issues are identified, existing conditions are described, and impacts expected under the No Action and Action Alternatives are discussed. This chapter concludes with a summary comparison of the alternatives and a list of mitigation measures.

The project area is located in Uintah County, Utah, along the Green River, which includes Thunder Ranch. Uintah County has a population of about 25,900 (U.S. Census, 2001). Vernal, Utah is the county seat with a population of 7,714. Jensen, Utah is approximately 3 miles down river from the project area. No population estimates are available for Jensen. Uintah County was historically dominated by ranching and gilsonite mining. A recent economic study (Perlich, 2003) was completed at Uintah County's request. The top five industries within Uintah County in descending order were Service (25.8%), Retail (17.2%), Government (15.3%), Mining (11.8%), and Farming and Agriculture Services (8.2%). It is important to note that Service industries support the other industries.

The lower-elevation lands along the Green River are arid to semiarid. The annual precipitation in the lower elevations of the area (in years 1951 to 1980) ranged from 7.75 inches at Jensen to 6.04 inches at the city of Green River, Utah. The area has hot summers and cold winters.

The climate and geologic formations make this area conducive to salinity and drainage problems. The Mancos Shale, the most common formation in the Jensen area, is more than 5,000 feet thick. It consists of gray and yellow weathering, soft, calcareous shales of marine origin. It contains a few sandstone lenses and nodular calcareous beds (Stephens et al., 1992). The prehistoric marine-based formation is high in boron, selenium, and uranium that may be leached and transported by water. Calcareous shale contains as much as 20 percent calcium carbonate in the form of finely precipitated materials or small organically fixed particles (Pettijohn, 1957).

Streamflow and floodplain habitat of the Green River has been significantly altered by water diversions and uses, infringement by railroads and pipelines, gravel operations, highways and bridges, flood control levees, channelization, and by the operation of upstream storage reservoirs (primarily Flaming Gorge Dam).



---

## **Land Use and Recreation**

Thunder Ranch is privately owned and totals about 2,000 acres in size. In 2003, The Recovery Program acquired a flood easement on 455 acres of floodplain bottomland within the Ranch to protect and enhance endangered fish habitat on the property by creating larval nursery habitat for razorback sucker. Colorado pikeminnow are also expected to benefit from the habitat enhancement.

The bottomland is separated from the Green River by an earthen levee. Historically, portions of the bottomlands were irrigated using dry wells and pumps. Thunder Ranch currently uses the bottomland primarily as wildlife habitat for elk, turkey, and waterfowl; however some livestock grazing may occur. The Recovery Program easement allows Thunder Ranch to continue these operations. The bottomlands contain several ponds and wetlands supported primarily from snowmelt and groundwater. Springs and seeps associated with irrigation return also contribute to the ponds and wetlands. The bottomlands are separated from the remaining portions of the Ranch by the Green River to the west, and a steep bluff to the east. The portion of the Ranch above the bottomlands is primarily used for irrigated agriculture, livestock grazing, and includes several residences and associated outbuildings.

Nine utility and pipeline easements have been recorded within or adjacent to the project area. These easements include:

1. Moon Lake Electric Association, Recorded 11-3-79 for electrical transmission or distribution line or system, Parcel 3;
2. Mid-American Pipeline Company, Recorded 10-27-99 for valve site and appurtenant rights, Parcel 5;
3. Mid-American Pipeline Company, Recorded 10-27-99 for valve site and appurtenant rights; Parcel 5;
4. Mid-American Pipeline Company, Recorded 10-27-99 for valve site and appurtenant rights; Parcel 5;
5. Questar Pipeline Company, Recorded 9-7-89 for gas pipeline and appurtenant rights; Parcel 5;
6. Questar Pipeline Company, Recorded 9-7-89 for gas pipeline and appurtenant rights; Parcel 5 and 7;
7. Chevron Inc. and Chevron Pipe Line Company, Recorded 5-28-85 for pipeline and appurtenant rights, Parcel 5;
8. MAPCO, Inc., Recorded 3-7-80 for pipeline and appurtenant rights, Parcel 7;
9. Pacific Northwest Pipeline Corporation, Recorded 8-19-55, Parcel 7;

Under both the No Action and Proposed Action, utility and pipeline easements through the Thunder Ranch bottomlands would continue to be used. The easement holders were contacted and reviewed the proposed action and have determined that it will not impact their utilities and pipelines or their ability to use these easements in the future if the offset levee were repaired to provide the current level of flood protection below the project area. A follow-up site visit will be

---

held with the easement holders prior to initiating construction activities.

Temporary construction access would utilize existing roads on the privately owned Thunder Ranch to access the project area. Heavy construction equipment would be needed to notch the levee and construct the seep collection system. If soil compaction occurs from heavy equipment use, disking may be necessary to revegetate the temporary access.

Land use would not change as a result of the proposed action and surrounding landowners would continue to be susceptible to seasonal flooding when river flows rise above the existing levee.

Recreation is limited primarily to hunting as permitted by Thunder Ranch. Hunting and recreation access would continue to be controlled by Thunder Ranch as described in the easement document. Recreation resources would not be affected by the proposed action.

### **Vegetation**

Two primary plant communities are found within the project area: the riparian community along the Green River and the bottomland ponds and wetlands.

The Thunder Ranch bottomlands can be characterized as an old abandoned river meander that has remnant depressions of the old river bed which may capture and store windblown snow in the late winter or early spring. In April and May, while the river is rising, the melting snow and spring precipitation adds to the surface water in these depressions and the ponded water surface expands. As the summer ensues, the wetlands begin to diminish through evaporative and groundwater flow through the old river channel alluvium. By late fall, the wetland ponds usually decrease to a relatively small surface water area which is densely vegetated with cattails and bulrush. The wetlands water surface area decreases throughout the summer despite being fed by seepage from the bluffs to the east. This groundwater seepage inflow to the wetlands is irrigation seepage water from the cultivated land to the east. Historical observations have indicated that in some years the ponded water in the wetlands may virtually disappear by mid-fall (Tetra Tech Inc., 1993).

### **Riparian Community**

Vegetation alongside the Green River consists predominately of cottonwoods, tamarisk, and willow. Box elder, red-osier dogwood, horsetail, *Forestiera*, rabbitbrush, common reed, saltgrass, sedges, and rushes are also found (Welsh et al., 1993) in the vicinity.

### **Bottomland Pond and Wetland Community**

Dominant vegetation within the bottomland pond and wetland community includes cattails, bulrushes, rushes and sedges. Scattered willow stands and cottonwoods occur in upland areas

---

between the ponds and wetlands. Surprisingly, tamarisk and other noxious weeds are not abundant within the bottomland community.

#### No Action

The No Action Alternative is predicted to have no effect on vegetation resources.

#### Proposed Action

The proposed action is predicted to have a beneficial effect the riparian community along the Green River based on evidence at levee removal sites at Ouray National Wildlife Refuge. Cottonwood and willow will likely expand as will the tamarisk and perennial pepperweed. The native vegetation should out-compete the non-native vegetation with the proposed flood frequency and duration. Uintah County identified concerns with potential spread of noxious weeds. They identified specific species of concern that may occur within the project area. These include whitetop, reed canary grass, purple loosestrife, knapweed, perennial pepperweed, Canada thistle, and Russian olive. Discussion with the Uintah County Weed Board identified Whitetop and tamarisk as the two species of concern species of concern within the project area (telephone conversation with Milt Billings, Uintah County Weed Board, 03/10/2004). The Recovery Program would assist the Uintah County Weed Board and the owners of Thunder Ranch to address noxious weed problems with the project area. Pre-project surveys and post-project monitoring will be conducted. If noxious weeds become a problem resulting from the project construction and operation, the Recovery Program will work with the Uintah County weed managers and the owner and managers of Thunder Ranch to address the situation.

Increasing the flood frequency would also likely have a beneficial effect on the bottomland ponds and wetland community. Increased flooding would result increased wetland vegetation (cattails, bulrush, rushes, sedges, etc.).

In consultation with the U.S. Army Corps of Engineers (Corps), the levee notching would require authorization under Section 404 of the Clean Water Act. Because fill material will be placed below the ordinary high water line, the activity would be within the jurisdiction of the Clean Water Act. Because the desired outcome is to provide seasonal connectivity between the pond and the Green River, the exposed sides of the outflow notch would need protection. The proposed action would protect the outflow notch with riprap material. In addition, construction of the seep collection system may require temporary discharges within jurisdictional wetlands to provide construction access. The installation of collection and delivery pipe within the wetlands and below the ordinary high water line would also be considered a discharge into "Waters of the United States". Reclamation has requested authorization from the Corps under Regional General Permit No. 57, Projects Beneficial to the Recovery of the Upper Colorado Endangered Fish Species. This proposed action would be beneficial for jurisdictional wetlands by providing additional water to support the ponds and wetlands and by improving water quality with seasonal flushing and dilution.

---

## **Fish and Wildlife Resources**

### **Fisheries**

In the Green River near Thunder Ranch, there are 27 fish species; of which 16 are exotic species that dominate the system (see Table 1). There are 11 native fish species. Four of these species are federally listed as endangered. Only seven species are considered abundant or common, of which only two (speckled dace and bluehead sucker) are native fish species. The mountain whitefish, mountain sucker, and mottled sculpin are native species considered rare or incidental in the Green River within the study area, but these species have not been given special status.

**Table 1-Nonnative and Native Fish Species in the Project Area**

<b>Abundant</b>	<b>Common</b>	<b>Rare—Incidental</b>	<b>Special Status</b>
<b>Nonnative Fish Species</b>			
Carp	Fathead minnow	Rainbow trout	None
Red shiner	Channel catfish	Brown trout	
	Black bullhead	Northern pike	
		Longnose dace	
		Creek chub	
		Sand shiner	
		White sucker	
		Utah sucker	
		Green sunfish	
		Smallmouth bass	
		Walleye	
<b>Native Fish Species</b>			
None	Speckled dace	Mountain whitefish	Razorback sucker
	Bluehead sucker	Mountain sucker	Humpback chub
		Mottled sculpin	Bonytail
		Flannelmouth sucker	Colorado pikeminnow
		Roundtail chub	

Several recent studies in backwater sites downstream of the project area have documented selenium in invertebrates and fish. Invertebrates are a common fish food. Levels of selenium found in plankton in Stewart Lake approximately 4 river miles downstream of Thunder Ranch,

---

were documented at 10 ppb dry weight. Extensive sampling in the Stewart Lake Waterfowl Management Area of the Green River also documented high levels of selenium contamination in fish. Geometric mean concentration of selenium ranged from 9.1 to as high as 47.9 ppb (Interior, 1997).

The normal background level of selenium in fish tissue nationwide is 1.7 ppb. Tissue levels from Stewart Lake and the Green River near Stewart Lake routinely exceed the threshold of 4 ppm for whole body samples known to cause impaired fish reproduction (Lemly, 1993). Conditions at the project site are predicted to be similar to those at Stewart Lake, but on a smaller scale. Irrigation return flows into the project area are smaller and drain a much smaller area, however, seeps and springs associated with these return flows, were reported have high selenium concentrations (Waddell, 2001).

### Avian Species

There are at least 209 species of birds potentially inhabiting the project area and vicinity. Approximately 43 percent of the total species in the study area are neotropical migrants. These migrants are the subject of increasing concern as their numbers continue to decline as a result of habitat loss and degradation, both in their northern breeding habitats as well as their southern wintering habitats in Mexico and Central and South America. Additionally, these migrants face mortality from hazards encountered during migration, such as power lines, buildings, predators, and severe weather.

Large numbers of waterfowl use the area, primarily during spring and fall migration periods. The Uintah Basin forms part of the Central Flyway and serves as an important stopover for waterfowl, with Stewart Lake a focal point for waterfowl use. Waterfowl that nest in the Uintah Basin include American coot, mallard, and gadwall. Elevated tissue levels of selenium have been documented in waterfowl collected from the Stewart Lake Waterfowl Management Area, and evidence of reproductive impairment in the form of embryo and chick deformities, as well as mortalities, has been documented (Stephens et al., 1988, 1992; Waddell and Wiens, 1994; and Hamilton, 1995). The project area is used by migrating and nesting Canada geese, with rare appearances by snow geese. Mallards, gadwalls, pintails, teals, shovelers, and mergansers are common migratory inhabitants along the middle Green River. Widgeon, redhead, canvasback, scaup, goldeneye, and ruddy ducks are occasionally found in the area (Interior, 1997).

Red-tailed hawks, northern harriers, golden eagles, pheasants, plovers, sandpipers, snipe, gulls and coots use habitats associated with or within the vicinity of the Thunder Ranch bottomlands. Great blue herons nest nearby, and white pelicans are occasional seasonal migrants. Peregrine falcons, and wintering bald eagles are found in the vicinity of the project area.



---

## Mammals

At least 46 species of mammals inhabit the project area and vicinity. Most mammals use the Thunder Ranch bottomlands and adjacent Green River. Some mammals use the adjacent agricultural land. Mammals occurring within the project area include but are not limited to mule deer, elk, and beaver. Given the documented evidence of selenium toxicity in water birds and fish species near the project area, it is possible that mammals in the area would exhibit selenium toxicity. However, no studies of selenium toxicity in mammals in the project area or vicinity have been conducted.

## Amphibians and Reptiles

Seventeen species of amphibians and reptiles use the study area and vicinity (Interior, 1997). Little is known about site-specific population numbers and species distributions, however. As with mammals, no research has been done on amphibians and reptiles in the project area to determine tissue levels of selenium. Those species that forage in the contaminated wetlands are likely to have elevated levels of selenium.

### No Action

Under the no action alternative, avian species, mammals and amphibians and reptiles would continue to be exposed to elevated selenium concentrations associated with the irrigation return flows into the Thunder Ranch wetlands and ponds. Fish species would continue to be excluded from the wetlands and ponds except during flow events that exceed the 10-year flow event (greater than 30,000 cfs). During flows greater than the 10 year event, fish species would become entrained in the ponds and wetlands and exposed to elevated selenium levels.

### Proposed Action

Under the proposed action, wildlife would be impacted by increased noise and activity during construction, however this would be short-term. Riparian and wetland dependent wildlife species would benefit from the increased freshening flows into the ponds and wetlands. Increased flood frequency and freshening flows would aid in reducing selenium concentrations in the Thunder Ranch bottomlands, which in turn would likely reduce tissue levels of selenium in avian species, mammals and amphibians and reptiles that currently use the Thunder Ranch bottomland. Construction of the seep collection system would assist in reducing selenium levels by collecting irrigation runoff and delivering it directly to the Green River for dilution.

Fish species that currently have access to the ponds and wetlands only at the 10-year flood frequency (greater than 30,000 cfs) or greater would also benefit with greater river connectivity. Fish species entrained in the Thunder Ranch bottomlands are exposed to elevated selenium levels without the ability to leave the bottomland ponds and wetlands. The proposed action would allow entrained fish to leave the ponds and wetlands with greater frequency, thus reducing

---

bioaccumulations of selenium in larger fish. It should be noted, however, that notching the levee would also increase the number of fishes exposed to selenium levels greater than those in the Green River. Effects to endangered fishes are discussed in greater detail in the next section.

### **Threatened and Endangered Species**

Informal consultation with the U.S. Fish and Wildlife Service identified 13 federally listed threatened or endangered species and four candidate species that may occur within the project area and vicinity. These include: 1) Colorado pikeminnow (*Ptychocheilus lucius*), 2) razorback sucker (*Xyrauchen texanus*), 3) humpback chub (*Gila cypha*), 4) bonytail (*Gila elegans*), 5) bald eagle (*Haliaeetus leucocephalus*), 6) Canada lynx (*Lynx canadensis*), 8) Mexican spotted owl (*Strix occidentalis lucida*), 9) Black-footed ferret (*Mustela nigripes*), , 10) Clay Reed-Mustard (*Schoenocrambe argillacea*), 11) Uinta Basin hookless cactus (*Sclerocactus glaucus*), 12) Ute Ladies's Tresses (*Spiranthes diluvialis*, and 13) Shrubby-Reed-mustard (*Schoenocrambe suffrutescens*). Western yellow-billed Cuckoo (*Coccyzus americanus occidentalis*), Graham beardtongue (*Penstemon grahamii*), Horseshoe milkvetch (*Astragalus equisolensis*), and White River Beardtongue (*Penstemon scariousus* var. *albifluvis*) are candidate plants species that may also occur within the project area.

For purposes of Section 7 Compliance, the Service conducted an intra-service formal consultation and received a biological opinion on the proposed action. Additional information on the consultation is discussed at the end of this section.

Suitable habitat does not occur within the project area for the following threatened and endangered species. Canada lynx, black-footed ferret, Mexican spotted owl, and shrubby reed-mustard. In addition, suitable habitat does not occur within the project area for candidate species: Graham beardtongue, horseshoe milkvetch, and White River beardtongue. Therefore, these were eliminated from further analysis. Species evaluated in detail are as follows:

### **Endangered Fishes**

#### **Razorback Sucker**

The razorback sucker was once one of the most abundant and widely distributed fish in the mainstem rivers of the Colorado River Basin (Jordan and Evermann, 1896; Minckley, 1973). A relatively large stock of razorback suckers remains in Lake Mohave (Minckley et al., 1991). However, the formerly large Lower Colorado River Basin populations have been extirpated from all natural riverine environments, and recruitment is nearly nonexistent in the remnant stocks (Minckley et al., 1991). In the Upper Colorado River Basin, razorback suckers persist in the lower Yampa and Green Rivers, mainstem Colorado River, and lower San Juan River (Minckley et al., 1991). The largest extent of riverine populations occurs in the upper Green River basin, particularly between "Razorback Bar" and Ashley Creek and includes portion of the Green River within the project area, but it consists of only about 500 fish (Interior, 1997). The Service

---

(1994b) designated 17 reaches of the Colorado River system as critical habitat for the razorback sucker. In the Upper Basin, critical habitat designations included portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San Juan Rivers and their 100-year floodplain. The project area is within designated critical habitat (Service, 2002a).

In riverine habitats, razorback suckers spawn in the spring with rising water levels and increasing temperatures. The fish move into flooded areas such as Ashley Creek and Stewart Lake in early spring, making spawning migrations to specific locations as they become reproductively active. Spawning occurs over rocky runs and gravel bars (Karp and Tyus, 1990). Known spawning sites are located in the lower Yampa River and in the Green River near Thunder Ranch between river km 492 and 501, but other, less-used sites are probable (Tyus and Karp, 1990; Modde and Wick, 1997; Modde and Irving, 1998).

Razorback sucker have high reproductive potential. McAda and Wydoski (1980) reported an average fecundity (N=10) of 46,740 eggs/fish (27,614—76,576), or about 39,600 eggs/kg. Inslee (1981) reported an average of 103,000 eggs/fish. Razorback sucker are broadcast spawners that scatter adhesive eggs over cobble substrate. Eggs incubate in interstitial spaces, and larvae must hatch and emerge from cobble substrates before being suffocated by deposited silt/sand (Minckley, 1983; Minckley et al., 1991; Wick, 1997).

In non-reproductive periods, adult razorback suckers occupy a variety of habitat types. These include impounded and riverine areas and habitats, including eddies, backwaters, gravel pits, flooded bottoms and flooded mouths of tributary streams, slow runs, sandy riffles, and others (Minckley et al., 1991). Summer habitat use includes deeper eddies, backwaters, holes and mid-channel sandbars (Karp and Tyus, 1990; Minckley et al., 1991).

Habitat used by juvenile razorback suckers has not been fully evaluated because of the low number of young fish in the river system. However, most studies agree that the larvae prefer shallow, littoral zones for a few weeks after hatching, and then disperse to deeper water areas (Minckley et al., 1991). Laboratory studies indicate that in a riverine environment, the larvae enter stream drift and are transported downstream (Paulin et al., 1990).

The State of Utah's integrated stocking plan for razorback sucker includes annual stockings of 9,930 age 2 (300 mm total length) razorback sucker/per year in the Middle Green River (River Miles 302-249) (Nesler et al., 2003) for a six year period. This includes the Green River within the project area.

### Colorado Pikeminnow

Natural populations of Colorado pikeminnow are restricted to the Upper Colorado River Basin in Colorado, Utah, and New Mexico and include only about 25 percent of its historic range (Service 2002b). The species is most abundant in the Green River from the mouth of the Yampa River to its confluence with the Colorado River (Service, 1991; Bestgen and Crist, 2000; Service, 2002b).

---

The Service (1994b) designated six reaches of the Colorado River system as critical habitat for the Colorado pikeminnow. Critical habitat is designated in portions of the Colorado, Green, Yampa, White, and San Juan Rivers in the Upper Basin. The project area is within designated critical habitat.

During winter, adult Colorado pikeminnow in the Yampa River use backwaters, runs, and eddies but are most common in shallow, ice-covered shoreline areas (Wick and Hawkins, 1989). In spring and early summer, adult Colorado pikeminnow use shorelines and lowlands inundated during typical spring flooding. This lowland inundation is important for health and reproductive conditioning (Tyus, 1990). Use of these habitats may offset winter stress and replenish energy stores needed for long migrations and spawning. Adults have been reported to migrate up to 200 miles upstream or downstream to reach spawning areas. Migration is an important component in the reproductive cycle of Colorado pikeminnow, and Tyus (1990) reported that migration cues, such as high spring flows, increasing river temperatures, and possible chemical inputs from flooded lands and springs, are important to successful reproduction.

Colorado pikeminnow spawn in whitewater canyons in the Yampa and Green Rivers. Reproduction is associated with declining flows in June, July, or August and average water temperatures ranging from 22 to 25 °C. After spawning, adults use a variety of habitats, including eddies, backwaters, and shorelines.

In the Green River basin, larval fish emerge from spawning substrates and enter the stream drift as young fry. The fish are then actively or passively transported downstream for about 6 days, traveling up to 100 miles to reach nursery areas (Tyus and Haines, 1991). These areas are productive habitats that consist of short-lived shoreline backwater areas that develop as spring flows decline. Such habitat is associated with lower gradient reaches.

The Middle Green River (from the confluence of the Yampa River downstream to the confluence of the White River near Ouray, Utah) is ecologically inseparable from the Lower Yampa River in that it not only benefits from Yampa flows, but also benefits Yampa River populations of the endangered fishes by providing them important nursery habitats from which fish are recruited as sub-adults into the Yampa River (Roehm, 2003).

### Humpback Chub

The Service designated seven reaches of the Colorado River system as critical habitat for the humpback chub (Service, 1994b). The closest reach to the project area is the section of the Green River from the confluence of the Yampa River downstream to the boundary of the Dinosaur National Monument (approximately 2 miles upstream from the project area).

---

The present distribution of humpback chub includes the lower 8 miles of the Little Colorado River, Arizona; the Colorado River in Marble and Grand Canyons, Arizona; Cataract and Westwater Canyons in Utah; Black Rocks Canyon in Colorado; Green River in Desolation and Gray Canyons, Utah; and in the Yampa and Green Rivers in Dinosaur National Monument, Colorado and Utah (Service, 1990b; Service, 2002c), where it is considered rare. A spawning population remains in the Yampa Canyon in Dinosaur National Monument near the confluence of the Green and Yampa Rivers (Karp and Tyus, 1990).

Populations of humpback chub are found in river canyons, where they use a variety of habitats including pools, riffles, and eddies. Fish are found associated with boulder-strewn canyons, travertine dams, pools, and eddies (Holden and Stalnaker, 1975; Kaeding and Zimmerman, 1983; Kaeding et al., 1990). This diversity in habitat use suggests that the adult fish are adapted to a variety of habitats, and studies of tagged fish indicate that they move between habitats, probably in response to seasonal habitat changes and life needs (Kaeding and Zimmerman, 1983; Karp and Tyus, 1990).

Humpback chub in reproductive conditions are usually captured in May, June, or July, depending on location. Little is known about their specific spawning requirements other than the fish spawn soon after the highest spring flows when water temperatures approach 20 °C (Karp and Tyus, 1990, Service 1990b). In Kaeding and Zimmerman (1983), the importance of spring flows and proper temperature for humpback chub is stressed. They also felt that flow reductions and low water temperatures in the Grand Canyon were factors curtailing successful spawning and increasing the humpback chub competition with other species.

### Bonytail

The bonytail is classified as endangered by the Service. It is a very rare species of fish. Since few individuals have been found in the last decade, it is believed that recruitment is nonexistent or very low. It is feared that wild populations of bonytail may soon become extinct (extirpated) without recruitment of young fish. The recovery priority for the bonytail indicates a high degree of threat with a low recovery potential under current habitat conditions (Maddux et al., 1993; Service, 2002d). It is apparent bonytail chub no longer exist in the Green River near the project area.

Six critical habitat reaches for the bonytail have been designated (Service, 1994b). The nearest critical habitat to the project area ranges from the confluence of the Green River with the Yampa River downstream to the Dinosaur National Monument Boundary (approximately 2 miles upstream from the project area),

The last known riverine area where bonytail were common was the Green River in Dinosaur National Monument where Vanicek (1967) and Holden and Stalnaker (1970) collected 91 individuals during 1962 to 1966. No bonytail have been caught in this portion of the Green River since captures in 1968 to 1970 by Holden and Stalnaker (1975), nor were any bonytail



---

captured in this reach during surveys from 1974 to 1976 (Seethaler et al., 1979), or 1981 to 1983 (Service, 1990).

The bonytail is a species adapted to mainstem rivers, where it has been observed in pools and eddies (Varicek, 1967; Minckley, 1973). Vanicek and Kramer (1969) reported spawning occurred in June and July at water temperatures of about 18 °C. Although wild bonytail are old fish, they are still capable of successful reproduction. When placed in ponds, they produced large numbers of young (Service, 1990a). Although habitats required for bonytail are not well known, the limited data suggests that flooded, ponded, or inundated riverine habitats may be suitable for adults, especially in the absence of competing nonnative fishes (Service, 1990a).

### No Action

Under the No Action Alternative, endangered fish would not benefit from increased access to the Thunder Ranch bottomland site. The existing levee would remain intact and only flows greater than 30,000 cfs (greater than the 10 year flow event) would connect the bottomlands with the Green River. Specifically, on the 10 year flow event, larval, sub-adult and adult razorback sucker and sub-adult and adult Colorado pikeminnow would have access to the backwater site. As flows reduce after spring runoff, sub-adult and adult fish would leave the backwater site. Larval razorback sucker would remain within the backwater site, isolated from the Green River until the next 10-year flow event. It is likely that most if not all razorback sucker larvae would experience high mortality losses because as water levels in the backwater decrease, oxygen levels would be depleted and selenium levels would continue to elevate as a result of irrigation runoff. The No Action Alternative would have no effect on baseline populations of razorback sucker, Colorado pikeminnow, humpback chub, and bonytail.

### Proposed Action

Under the proposed action, sub-adult and adult razorback sucker and Colorado pikeminnow would benefit while connection existed between the Thunder Ranch bottomlands and the Green River. As a portion of the Green River flows through the bottomlands, additional habitat would be available to sub-adult and adult fish. As flows begin to reduce, sub-adult and adult fish would leave the backwater site and return to the Green River. River flows would dilute selenium concentrations during the flow through period, and razorback sucker and Colorado pikeminnow would not be exposed to elevated selenium levels in the bottomland ponds and wetlands.

Larval razorback sucker would benefit from the increased access to the Thunder Ranch bottomland ponds and wetlands, which would serve as functional nursery habitat. Larval razorback sucker could remain in the protected bottomland nursery habitat for the needed two year period for growth before returning to the Green River during spring runoff greater than the 1.1-year frequency (greater than 12,000 cfs). The bottomland site would provide warmer water temperatures than the Green River, provide adequate food supplies, and protect the larval fish from predation. The “Razorback Bar” located upstream would be the primary source for drifting larval razorback sucker.

---

Larval razorback sucker however may be exposed to elevated selenium levels during periods of drought when the 1.1 year flow event is not met and connection between the Green River, and the bottomland ponds and wetlands is not established. During these periods, snowmelt, rain, groundwater and irrigation return would be the only water source for the ponds and wetlands. During these periods, selenium levels would likely become elevated, and may expose larval fish to toxic selenium levels. The potential for this to occur would be reduced by the installation of a seep collection system as described in the proposed action. The seep collection system would collect a portion of the irrigation runoff and drain it directly to the Green River for dilution. The freshening flows would also provide additional flows to the ponds and wetlands to assist in selenium dilutions with flows less than the 1.1 year frequency. In addition, flows greater than the 1.1 year flow event (greater than 12,000 cfs) would dilute and flush selenium concentrations in the bottomland ponds and wetlands.

Because the proposed action is predicted to provide additional access to sub-adult and adult razorback sucker and Colorado pikeminnow during periods when selenium concentrations are diluted and not a concern, the proposed action may affect, but is not likely to adversely affect, Colorado pikeminnow, and sub-adult and adult razorback sucker. Because the proposed action may increase larval razorback sucker exposure to elevated selenium levels during extended drought periods, the proposed action may affect, likely to adversely affect, larval razorback sucker. Incidental take coverage would be needed to address these potential losses. It should be noted however, that overall, the proposed action would be beneficial to larval razorback sucker by increasing available nursery habitat, and increasing potential razorback sucker recruitment in the Green River and assisting in razorback sucker recovery.

Bonytail and humpback chub are primarily restricted to habitats upstream of the project area within Dinosaur National Monument. Humpback chub and bonytail have not been documented within the project area; therefore the proposed action would have no effect on bonytail and humpback chub.

The proposed action may affect, not likely to adversely affect (Beneficial Effect), Colorado pikeminnow; and would not adversely modify their designated critical habitat. The proposed action would have no effect on bonytail or humpback chub.

### Bald Eagle

The bald eagle is a federally listed threatened species in the United States. Bald eagles are commonly seen in the project area, and the nearby Stewart Lake Waterfowl Management Area and the Ouray National Wildlife Refuge in the winter. Stephens et al. (1992) documented the presence of bald eagles in the Stewart Lake Waterfowl Management Area during 1988 and 1989 nesting surveys.

Wintering bald eagles are associated with unfrozen lakes, rivers, and wetlands. Prey density, suitable perch and roost sites, weather conditions, and freedom from human disturbance

---

determine the location of wintering eagle concentrations (Ohmart and Sell, 1980). Eagle numbers normally vary considerably at particular wintering areas. Wintering bald eagles on the project area have not been observed but are likely to perch in large cottonwood trees.

The trait of feeding on dead or dying waterfowl may be an important factor in the project area. However, ice cover restricts prey availability during winter. Data regarding various trace elements in prey species within the project area is limited to a Service investigation in 1993 (Service, 2001). The Service collected 9 American coot (*Fulcia Americana*) eggs from the Thunder Ranch bottomlands. Selenium concentrations in American coot embryos ranged from 2.56 to 4.92 µg/g dry weight. Selenium concentrations in coot embryos were not substantially elevated; however, one embryo had a deformed bill. However, selenium concentrations in aquatic macro-invertebrates collected during the 1993 evaluation were at levels of concern (6.41 to 7.22 µg/g dry weight) (Service, 2001). For birds collected at Stewart Lake, selenium levels in tissues of waterfowl exceed 6 ppm, the food toxicity level thought to result in reproductive impairment in consumer organisms (Interior, 1997).

#### No Action

The No Action alternative would have no effect on the bald eagles within the project area.

#### Proposed Action

Under the proposed action, increased seasonal flows into the bottomlands from the Green River, freshening flows, and construction of the seep collection system would aid in reducing bottomland selenium sources and concentrations. This in turn, would likely result in reduced selenium concentrations in bald eagle prey species. This effect would be beneficial to the bald eagle. Short-term impacts could occur if construction activities occur when the eagle was present in the area during winter. The presence of people and equipment during construction activities would likely temporarily displace eagles to nearby riparian or pond areas. Wintering habitat for bald eagles is not limiting in the vicinity of the project area. Therefore, the proposed action may affect, but is not likely to adversely affect, bald eagles within the project area.

### Western Yellow-billed Cuckoo

The Western Yellow-billed cuckoo is as a Federal candidate species. The taxonomy of yellow-billed cuckoo subspecies has had considerable debate. Most authors have recognized both an eastern and western subspecies. Only the western yellow-billed cuckoo occurs in Utah. Its historic range included all states west of the Rocky Mountains and extended into southern British Columbia at the northern extent and into the northwestern states of Mexico at the southern limits. Estimates of the number of current breeding pairs range widely; however, it is apparent that the cuckoos' population and range have largely diminished since the subspecies was described in 1877. Currently, the range of the cuckoo is limited to disjunctive fragments of riparian habitats from northern Utah, western Colorado, southwestern Wyoming, and southeastern Idaho

---

southward into northwestern Mexico and westward into southern Nevada and California (Parrish et al., 1999). Cuckoos are long-range migrants that winter in northern South America in tropical deciduous and evergreen forests.

Historically, cuckoos were probably common to uncommon summer residents in Utah and across the Great Basin. The current distribution of yellow-billed cuckoos in Utah is poorly understood, though they appear to be an extremely rare breeder in lowland riparian habitats statewide (Parrish et al., 1999).

Yellow-billed cuckoos are one of the latest migrants to arrive and breed in Utah. They arrive in extremely late May or early June and breed in late June through July. Cuckoos typically begin their southerly migration in late August or early September. Yellow-billed cuckoos feed almost entirely on large insects that they glean from tree and shrub foliage (Parrish et al., 1999).

Nesting habitat is classified as dense lowland riparian characterized by a dense sub-canopy or shrub layer (regenerating canopy trees, willows, or other riparian shrubs) within 100 meters of water. Overstory in these habitats may be either large, gallery-forming trees (10-27 meters) or developing trees (3-10 m), usually cottonwoods. Nesting habitats are found at low to mid-elevations (2,500-6,000 feet) in Utah. The nest is a loosely arranged platform of twigs lined with softer materials such as grass, rootlets, and dried leaves. Females lay 1-8 eggs (usually 3) over a period of 9-11 days. Young are brooded by both adults for 7-8 days before leaving the nest. Young climb on branches for about 2 weeks after leaving the nest until they are capable of flight. It is not known whether cuckoos have more than one brood per season in Utah, but multiple brooding has been recorded in California (Utah Division of Wildlife, Parrish et al., 1999). Yellow-billed cuckoo nesting behavior may be closely tied to food abundance. In years of low food abundance, cuckoos may forego nesting; in years when the food supply is abundant, cuckoos may lay a large number of eggs and even parasitize the nests of other species (Nolan and Thompson, 1975). Cuckoos are rarely hosts to brown-headed cowbirds.

Yellow-billed cuckoos are considered a riparian obligate and are usually found in large tracts of cottonwood-willow habitats with dense sub-canopies.

#### No Action

The no action alternative would have no effect on the western yellow-billed cuckoo.

#### Proposed Action

The presence or absence of western yellow-billed cuckoo has not been determined. Marginal habitat occurs within the project area and it is likely that migrating cuckoos may use the project area for foraging. The project area lacks the preferred dense cottonwood overstory, but dense understory is abundant in the project area. The proposed action would occur outside of the normal nesting season and would not affect cuckoo nesting. Migrating cuckoos may avoid the

---

project area during construction; however, migrating habitats are common in the vicinity of the project area.

Yellow-billed cuckoo are predicted to benefit from the proposed action in the long-term with increased habitat due to seasonal flooding and by reduced selenium levels in bottomland invertebrates. Therefore, the proposed action is predicted to not likely jeopardize the continued existence of the Federal candidate western yellow-billed cuckoo.

### Clay Reed-Mustard

The Utah Natural Heritage Program ranks this plant species as G1, critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals) or because of some factor of its biology, making it especially vulnerable to extinction (Forest Service et al., 1991). It is classified as a federally endangered species.

The clay reed-mustard is an endemic species, known only from the vicinity of Big Pack Mountain at the flank of the east Tavaputs Plateau (Goodrich and Neese, 1986). The Forest Service et al. (1991) indicate that it is endemic to the Bookcliffs in Uintah County, Utah.

This species inhabits the mixed desert shrub community of shadscale, Indian ricegrass, and pygmy sagebrush species on the lower Uinta and upper Green River shale formations at elevations of 5,000 to 5,650 feet, blooming in May to early June (Forest Service et al., 1991). It is unlikely that this species occurs in the project area.

#### No Action

The No Action Alternative would have no effect on clay reed-mustard.

#### Proposed Action

Suitable habitat for this species does not exist in the project area. Therefore, the proposed action would have no effect on clay reed-mustard.

### Uinta Basin Hookless Cactus

The Uinta Basin hookless cactus is listed as threatened. This species is threatened by commercial exploitation and industrial development. This species occurs in Duchesne and Uintah Counties, Utah and Delta and Mesa, Counties, Colorado (Welsh, 1979).

The cactus occurs in gravelly soils on hills and mesas in the desert shrub community at elevations from 4,000 to 6,000 feet. It could occur in upland areas adjacent to the project area, but no activities are scheduled for these upland sites.



---

### No Action

The No Action alternative would have no effect on Uinta Basin hookless cactus.

### Proposed Action

No suitable habitat occurs within the project area. Adjacent upland habitats that may provide suitable habitats will not be affected by the proposed action. Therefore, the proposed action would have no effect on Uinta Basin hookless cactus.

## Ute Ladies'-Tresses

The Ute ladies'-tresses orchid was federally listed as a threatened species on January 17, 1992. The Ute ladies'-tresses orchid was never common, occurring over a wide range in small scattered populations. It depends on natural stream processes, and probably natural ungulate (hoofed animal) population levels and behavior, to create and maintain habitat. Both of these environmental features have been radically modified in recent decades. Orchid habitat is grazed heavily by domestic livestock, while native ungulates have been driven from winter range by agricultural and urban development. The intensity and timing of grazing have shifted significantly from that of the native ungulates. Dams, reservoirs, and diversions have altered natural river hydrographs. Streams have been channelized, streambanks riprapped, and flood plains developed for agriculture and urban uses. Increasing recreational use of streams and riparian areas has increased the vulnerability of the orchid to trampling, soil compaction, and changes in stream hydrology. Invasion of exotic species such as whitetop (*Cardaria spp.*), reed canarygrass (*Phalaris arundinaceae*), purple loosestrife (*Lythrum salicaria*), Canada thistle (*Cirsium arvense*), and Russian olive (*Eleagnus angustifolia*) are serious threats to this orchid.

These factors, coupled with a low reproductive rate and the tendency to occur in small isolated populations, increase vulnerability to localized catastrophic events, resulting in extirpation of individual populations. The apparent tendency for populations of Ute ladies'-tresses to fluctuate dramatically from one year to the next makes it difficult to assess the population status and distribution. Due to the difficulty in finding individual plants, monitoring is typically done by counting the number of flowering plants.

The orchid occurs primarily in areas where the vegetation is relatively open and not overly dense or overgrown (Coyner, 1989, 1990; Jennings, 1990). A few populations in eastern Utah and Colorado are found in riparian woodlands, but the orchid seems generally intolerant of shade, preferring open, grass, and forbs-dominated sites instead. Plants usually occur as small scattered groups and occupy relatively small areas within the riparian system (Stone, 1993). Once established, Riedel (1992) reported the orchid appears to be tolerant of somewhat drier conditions, as exemplified by conditions in Dinosaur National Monument, but loses vigor and may gradually die out if the groundwater table begins to consistently drop during late summer.

The orchid appears to be well adapted to disturbances caused by water movement through flood plains over time (Service, 1995). It often grows on point bars and other recently created or “raw” riparian habitat. It tolerates flooding and flood disturbance. For example, point bars and backwater areas (old oxbows, side channels, etc.) are often flooded for several months in the spring during snowmelt.

**Table 2-Summary of Effects to Threatened, Endangered and Candidate Species in the Project Area**

Species	Scientific Name	Project Effect(s)	Status
Razorback Sucker	<i>Xyrauchen texanus</i>	May affect, likely to adverse effect (w/ beneficial effects)	Endangered
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	May affect, not likely to adversely affect (beneficial effect)	Endangered
Humpback Chub	<i>Gila cypha</i>	No effect	Endangered
Bonytail	<i>Gila elegans</i>	No effect	Endangered
Bald Eagle	<i>Haliaeetus leucocephalus</i>	May affect, not likely to adversely affect (beneficial effect)	Threatened
Canada Lynx	<i>Lynx canadensis</i>	No effect	Threatened
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	No effect	Threatened
Black-Footed Ferret	<i>Mustela nigripes</i>	No effect	Endangered
Western Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	Not likely to jeopardize the continued existence of	Candidate
Clay Reed-Mustard	<i>Schoenocrambe argillacea</i>	No effect	Threatened
Shrubby Reed-Mustard	<i>Schoenocrambe suffrutescens</i>	No effect	Endangered
Uinta Basin Hookless Cactus	<i>Sclerocactus glaucus</i>	No effect	Threatened
Ute Ladies'-Tresses	<i>Spiranthes diluvialis</i>	May affect, not likely to adversely affect (Beneficial Effect)	Threatened
Graham Beardtongue	<i>Penstemon grahamii</i>	No effect	Candidate
Horseshoe Milkvetch	<i>Astragalus equisolensis</i>	No effect	Candidate
White River Beardtongue	<i>Penstemon scariosus</i> var. <i>albifluvis</i>	No effect	Candidate

---

Populations of Ute ladies'-tresses occur in three general areas of the interior Western United States. Of concern to the Middle Green River is the central population of plants located in riparian meadows or in understory wetland meadows of riparian woodlands in the Colorado River drainage of eastern Utah. This species occurs on all the major drainages to the Green River along the south slope of the Uinta Mountains in the northern portion of the Uinta basin. The estimated population size for the mainstem Green River is 1,600. Populations have been documented in the vicinity of the project area.

#### No Action

The No Action Alternative would have no effect on Ute ladies'-tresses.

#### Proposed Action

Suitable habitat occurs within the project area for Ute ladies'-tresses. Construction activities could adversely affect the plants. No plants occur on the existing levee where the proposed seven notches and the outlet structure would be constructed. A survey for plants along the proposed seep collection system by Reclamation would occur prior to its construction. While no plants have been located thus far in the area, it is possible that they occur. If any plants are found, the Service would be consulted and the construction plan revised to protect the plant and its habitat. Overall, restoring the flood frequency of the bottomland would be a benefit Ute ladies' tresses and likely create additional suitable habitat. Therefore, the proposed action may affect, but is not likely to adversely affect Ute ladies'-tresses.

### Section 7 Consultation Summary

The Service conducted an intra-service Section 7 consultation (6-UT-01-F-004 FWS/R6 ES/UT) to comply with the Endangered Species Act. The Service issued a biological opinion for the proposed action on March 30, 2004. A copy of the opinion is included in the appendices.

The Service determined that the project would not affect the lynx. The Service also concurred that the project as proposed may affect, but is not likely to adversely affect the Colorado pikeminnow, bald eagle, Western yellow-billed cuckoo and the Ute ladies' -tresses. The Service further concurred that the project as proposed will have no effect on the humpback chub, bonytail, Mexican spotted owl, black-footed ferret, clay reed-mustard, shrubby reed-mustard, Uinta Basin hookless cactus, Graham beardtongue, horseshoe milkvetch and White River beardtongue.

After reviewing the current status of the razorback sucker, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, the Service through its biological opinion determined that the floodplain habitat restoration at Thunder Ranch, as proposed, is not likely to adversely modify designated critical habitat. The conclusion was based on the following factors described in the biological opinion: 1) the primary effect of the proposed action would improve habitat for the razorback sucker at the Thunder Ranch

---

bottomlands, and 2) the proposed action would not adversely modify designated critical habitat, and would be beneficial in efforts to recover endangered fishes.

The Service's biological opinion also determined that the floodplain habitat restoration at Thunder Ranch, as proposed is not likely to jeopardize the continued existence and may enhance the existence of the razorback sucker by providing nursery habitat for the species. The conclusion was based on the following factors described in the biological opinion: 1) water quality, specifically selenium concentrations within the Thunder Ranch bottomlands would be improved, 2) the proposed action may adversely affect larval razorback sucker during drought periods if exposed to elevated selenium levels, and 3) selenium levels would be monitored by the Service to determine if additional remediation is necessary.

The Service anticipates an unknown, but small number of razorback sucker may be taken as a result of the proposed action. The incidental take is expected to be in the form of death or physical injury from temporary exposure to selenium. The exact number of individuals that may be taken as a result of the proposed action is not definable. This is a result of the uncertainty that selenium will accumulate to toxic levels during drought periods, and the uncertainty of the number of individual razorback suckers may be in those backwaters. However, with the implementation of the conservation measures that are part of the proposed action, and the small number of fish likely in the potentially affected backwaters, the number of individuals taken should be very low.

The Service in its biological opinion identified the following as Reasonable and Prudent Measures to minimize incidental take of the razorback sucker.

- 1) Conduct all proposed actions in a manner that will minimize take of listed species and minimize the destruction or modification of critical habitat.
- 2) The Service will maintain complete and accurate records of actions which may result in take of razorback sucker.

In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act, the Service must comply with the following term and conditions, which implement the reasonable and prudent measures described and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

- 1) Construction conducted by Reclamation will use best management practices, technical advice and biological information to minimize adverse effects to razorback suckers and its habitat;
- 2) The Colorado River Endangered Fish Recovery Program will submit a report to the Service upon completion of activities related to construction within and immediately adjacent to the river corridor. The report shall include monitoring results of razorback sucker discovered at the construction site, a description and explanation of any project

---

mitigation measures which were not implemented or which had a result not otherwise expected, and complete and accurate records of any incidental take that occurred during the course of the project.

3) The Service shall be notified immediately if any dead fish are detected during any one event within 0.5 miles upstream and 0.5 miles downstream of construction activities. Any construction activities that may be contributing to the introduction of toxic material or other causes of fish mortalities must be immediately stopped while the Service is contacted and until we agree the situation is remedied. If upstream monitoring from the construction site demonstrates that the source of dead fish is not related to construction activities, the Service is to be notified, but construction may proceed.

### **Water Quality**

Elevated salinity and selenium levels occurring in backwaters, lakes and ponds along the Middle Green River have resulted in the implementation of federal programs to address water quality issues. Reclamation and the Natural Resource Conservation Service have implemented salinity control projects in the Jensen Unit to reduce salt loads in the Green River mainstem as part of the Colorado River Salinity Control Program. Projects have been limited primarily to the lining of irrigation canals, piping laterals, and on-farm efficiency improvements.

### **Selenium & Contaminant Levels**

The National Irrigation Water Quality Program evaluated selenium levels in selected backwater sites along the Green River. Elevated selenium levels were detected from samples collected from Stewart Lake (approximately 5 miles downstream of the project area) (Interior, 1997). Water quality data collected in the Green River show good water quality with selenium levels less than 2 part per billion, however selenium concentrations in Stewart Lake were high (~21 µg/L near the drains and 5 µg/L near the outlet channel (Interior, 1997).

Data from the Thunder Ranch bottomland ponds and wetlands is limited. In 1993-94, the U.S. Geological Survey sampled selected sites within the Thunder Ranch bottomlands. Selenium levels were significantly higher in the seeps and sediments than from water samples collected from the ponds and wetlands. In addition, selenium levels were higher in the northeastern portion of the bottomlands. In 1993, samples showed selenium levels of 5 µg/L from irrigation runoff feeding springs and seeps and 1 µg/L in the marsh. The 1994 samples were more intensive and collected water, sediment, and biota samples from springs and seeps, marshes, and points along the Green River. Figure 4 shows high selenium concentrations in springs and seeps near the north pond. Waddell (2001) sampled six selected sites within the Thunder Ranch bottomlands. Table 3 compares selenium concentrations measured in 1993-94 with samples collected in 2001. The major concern identified was seepage presumably as a result of irrigation on adjacent fields.

**Table 3-Selenium Data Summary for the Thunder Ranch Bottomlands**

Site	Year	Media	Selenium Concentration	Hazard
1	2001	Water	2.8 µg/L	Low
2	2001	Water	0.3 µg/L	Low
3	2001	Water	0.4 µg/L	Low
	2001	Soil	0.4 µg/L	None
4 (South Pond)	2001	Water	4.1 µg/L	High
	1993	Water	<1.0-1.0 µg/L	Minimal
	1993	Water	<1.0 µg/L	Minimal
	1993	Seep	5 µg/L	High
	1993	Soil	1 µg/L	Minimal
	1993	Invertebrates	6.91 µg/L	High
	1993	Eggs	3.2 µ	Minimal
	1994	Water	<1.0-1.0 µg/L	Minimal
	1994	Seep	5.0-14.0 µg/L	High
	1994	Soil	1.4 µg/L	Minimal
	1994	Invertebrates	5.8 µg/L	High
4 (Middle Pond)	1994	Water	1.5 µg/L	Minimal
	1994	Seep	1.5 µg/L	Minimal
	1994	Invertebrates	7.8 µg/L	High
	1993	Eggs	2.8 µg/L	Minimal
5 (North Pond)	2001	Seep	1580 µg/L	High
	1994	Water	142.7 µg/L	High
	1994	Seep	813.9 µg/L	High
	1994	Soil	17.5 µg/L	High
	1994	Invertebrates	25.7 µg/L	High
6	2001	Soil	4.3 µg/L	High

A quantifiable assessment of these sites regarding selenium hazards could not be made during the sampling period. Of particular concern during the assessment were selenium concentrations from seeps in the north pond area (Figure 4). Irrigation practices have changed significantly since the 2001 sampling period. Thunder Ranch was recently purchased and the new owners

---

installed side-roll sprinkler systems and cultivated crop types reducing the amount of irrigation runoff. The amount of reduced runoff that contributes to the springs and seeps has not been quantified. However, reduced irrigation runoff is expected to assist in lower selenium loading to the bottomland ponds and wetlands. No other features were noted of serious concern from a contaminant perspective except a natural gas pipeline and power pole with transformers near an irrigation pump.

#### No Action

Under the No Action Alternative, selenium levels in the Thunder Ranch bottomland would likely continue to remain high. No remediation actions would be implemented to reduce selenium levels.

#### Proposed Action

Under the proposed action, a seep collection system would collect a portion of the springs and seeps (approximately 100 feet of perforated pipe) using perforated pipe, and transport them via a conveyance pipe directly to the Green River. The Green River would dilute the selenium concentrations to an undetectable level. In consultation with the Service, the hottest selenium sources were identified for collection. The conveyance pipe outlet at the river will be located upstream of two constructed levee notches and will be fitted with a hinged gate to prevent high river flows from depositing sediments in the pipe and to prevent rodents from nesting in the pipe during low flow periods. This would also assist in reducing the reintroduction of selenium-laden water into the bottomland site through the two downstream notches during periods when the bottomlands are connected to the river.

Notching the existing levee and increasing the frequency of the connection between the bottomlands and the Green River would also assist with dilution. In addition, freshening flows provided by the dry wells would also provide some dilution. The Service would monitor selenium concentrations in the bottomlands after construction to determine if additional management actions are necessary. If monitoring indicates that selenium levels remain elevated, the Recovery Program would take appropriate management action. The owner and managers of Thunder Ranch have been very cooperative and have voluntarily altered irrigation practices to reduce levels of selenium. The Recovery Program and Service will continue to work cooperatively with the owner and managers of Thunder Ranch to address selenium issues if they arise. However the owner and managers of Thunder Ranch are under no obligation to alter their irrigation practices.

The proposed action is predicted to improve water quality conditions at the Thunder Ranch Bottomland. Based on the quantity, quality and the dilution effects of the Green River, effects of proposed action on water quality in the Green River would be undetectable.

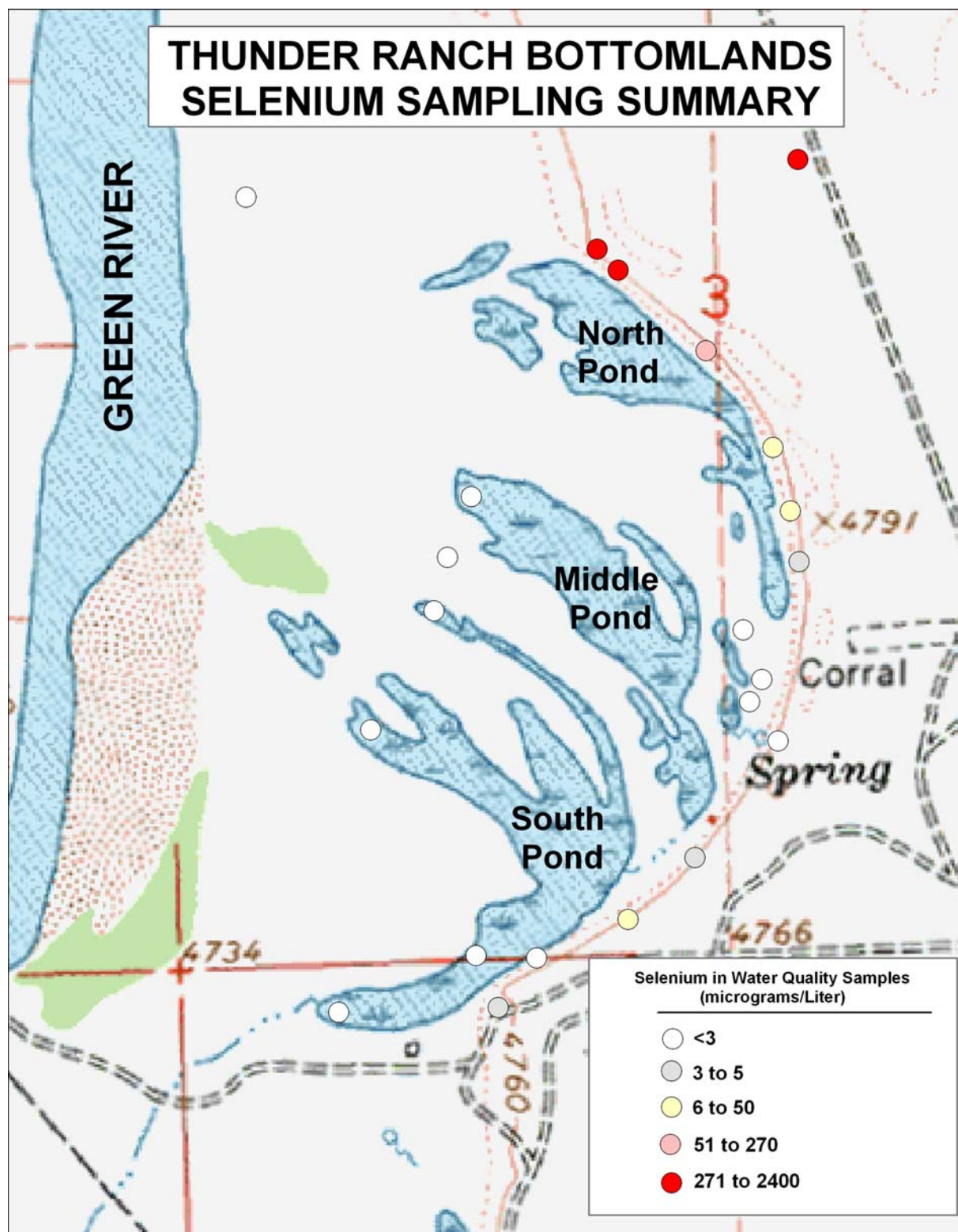


Figure 4-Thunder Ranch Bottomland Selenium Levels



---

## **Water Rights**

The proposed action does not affect the amount of water or ability to divert water for consumptive uses in the Green River. The proposed action will not affect flows in the Green River. The project is designed to reconnect the Thunder Ranch floodplain wetlands with the river. Under existing conditions, Green River flows would have to exceed 30,000 cfs to overtop the man-made levee that has been constructed between the river and the wetlands. After the levee is notched, flows between 12,000 and 16,900 cfs will connect the river to the wetlands. All river flows that pass through the wetlands will be returned to the Green River via the outlet channel and therefore, the proposed action is predicted to have no effect on water rights.

## **Historical and Cultural Resource Properties**

Cultural resource inventories were conducted under contract by Grand River Institute of Grand Junction, Colorado. A class III inventory of 330 acres conducted between February 25 and March 2, 2004 (Conner and Davenport, 2004). The survey identified three prehistoric archaeological sites (42UN3644, 42UN3645, and 42UN3646), four historical sites (42UN3647, 42UN3648, 42UN3651, and 42UN3697), and one isolated find. Site 42UN3644 was field evaluated as significant and eligible for listing on the National Register of Historic Places. The isolated find and the remaining sites were field evaluated as non-significant and not eligible. The Report recommended that the eligible site be avoided or mitigated should there be potential or real impacts.

Reclamation has initiated consultation with the Utah State Historic Preservation Officer (SHPO) and proposes to avoid impacts to the eligible site by fencing the site's perimeter to avoid it during construction. Consultation with the SHPO will be completed prior to initiating construction. The eligible site is a large open camp consisting of fire-altered cobble and associated artifacts and is located on the terrace above the Thunder Ranch bottomlands and outside of the Green River floodplain and would not be affected increased seasonal flooding. Reclamation would also avoid the non-eligible sites during construction.

Under both the No Action and Proposed Action alternatives, historical and cultural resource properties would not be affected.

## **Indian Trust Assets**

Indian Trust Assets are legal interests in property held by the United States for Indian Tribes or individuals. Reclamation and other Federal agencies share the responsibility to protect these assets. Reclamation consulted with the Ute Indian Tribe to determine if Indian Trust Assets could be affected by the proposed action. No Indian Trust Assets were identified, therefore the proposed action is predicted to have no effect on Indian Trust Assets.

---

## **Environmental Justice**

Executive Order 12898 on Environmental Justice provides that Federal agencies analyze programs to assure that they do not disproportionately adversely affect minority or low income populations or Indian Tribes. There are no potentially affected minority or low income populations in the project area, and no adverse effects related to environmental justice are predicted.

## **Health and Safety/Disease Vectors**

Standing water provides breeding habitat for mosquitoes and other biting flies. These insects can serve as potential disease vectors. The Uintah County Mosquito Abatement District has an active control program that includes the project area. According to Dr. Steven Romney, the Abatement District has previously applied BTI larvicide within the project area for mosquito abatement. The larvicide is aerially applied and the district maintains a 200 yard buffer along the Green River. Dr. Romney expressed concerns that additional treatments in 2004 may be necessary to address West Nile virus and that he would coordinate activities with the Recovery Program (telephone conversation with Dr. Steven Romney, Uintah Mosquito Abatement District, 3/26/2004).

The Bureau of Land Management consulted with the Service regarding the mosquito abatement program on BLM lands. The Service concurred with BLM's determination that the program may affect, not likely to adversely affect, federally listed species. The Contract and Grant of Easement executed on August 29, 2003 between the Bureau of Reclamation and Thunder Ranch, LLC, establishes "a perpetual flowage easement to intermittently and completely seep, flood, overflow, and inundate" the easement lands. Section 3(e) of the contract and grant of easement states the following:

"Grantor, hereby grants to the United States Department of the Interior the exclusive right to remove, stock, manage, and control all fishes as deemed necessary and the right to control insects and invasive plants as deemed necessary by the representatives of the United States".

Section 3(g) states:

"Grantor agrees to not intentionally take action or utilize methods with regard to controlling noxious weeds or insects that would harm, endanger, or interfere with the threatened or endangered fishes without the permission of the Secretary of Interior or his authorized representative. However, Grantor reserves the right to utilize any methods necessary to control insects to protect their farming operation".

The Thunder Ranch bottomlands provides suitable habitat for mosquito production with its existing ponds and wetlands. It is not likely that the proposed action will result in increased mosquito production. Rather, the reintroduction of seasonal river flow through the existing ponds may result in decreased mosquito production reducing the timing and duration of standing and stagnant water which support mosquito production. The Recovery Program will work

---

cooperatively with the Uintah County Mosquito Abatement District and the owners of Thunder Ranch to monitor and provide mosquito abatement as needed to protect public health, while also protecting endangered fishes and other non-target species.

### **Socioeconomic**

There is no direct socioeconomic effect to implementing the proposed action other than some limited employment opportunities during construction. Reclamation's Provo Construction crew would perform the construction activities associated with the proposed action. Indirectly, the proposed project is designed to enhance endangered fish habitat to increase the likelihood of endangered fish recovery, allowing continued water development in the Upper Colorado River Basin as identified in the Recovery Program goals.

### **Cumulative Impacts**

Cumulative impacts are impacts on the environment, which result from the incremental impact of the action, when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Past and present activities that have affected river-related resources in the area include irrigation, urban development, and recreational activities associated with construction and operation of the Flaming Gorge Dam, and the Central Utah Project, Colorado River Salinity Control Project, and activities associated with the Upper Colorado River Endangered Fish Recovery Program.

Implementation of all or any of these projects has affected and continues to affect the human environment including but not limited to water quality, water rights, socioeconomic and wildlife resources. Incremental cumulative impacts associated with the implementation of the proposed action are anticipated to be too small to measure.

### **Summary and Environmental Commitments**

In summary, the primary effect of the proposed action would improve habitat for the Colorado pikeminnow and razorback sucker at the Thunder Ranch bottomlands.

The proposed action is predicted to have no effect on land use, water rights, Indian Trust Assets, and historical and cultural resources. The proposed action would also have no effect on the bald eagle, or humpback chub. The proposed actions may affect, but is not likely to adversely affect the Colorado pikeminnow. Some razorback sucker larvae may be adversely affected during drought periods if exposed to elevated selenium levels. The Service would monitor selenium levels in the Thunder Ranch bottomlands to determine if additional action is necessary. The proposed action would not adversely modify designated critical habitat, and would be beneficial in efforts to recover endangered fishes.

---

Wildlife would be impacted by increased noise and activity during construction, however this would be short-term. Riparian and wetland dependent wildlife and fish species would benefit from additional habitat access and freshening flows into the bottomlands. Fish and wildlife species would also benefit from improved water quality and reduced selenium concentrations in the Thunder Ranch bottomlands.

Vegetation resources impacts would be limited to temporary construction disturbances. Clean Water Act Section 404 authorization would be obtained to discharge riprap material to protect the outflow channel.

Water quality, specifically selenium concentrations within the Thunder Ranch bottomlands would be improved. Selenium levels would be monitored by the Service to determine if additional remediation is necessary.

#### Mitigation Measures

- 1). Construction activities will be coordinated with the owner and managers of Thunder Ranch and will comply with all conditions set forth in the easement document.
- 2). Section 404 authorization will be obtained from the Corps prior to initiating construction activities. Removed levee material will be discharged in upland sites above the ordinary high water line and used to construct the offset levee.
- 4). Construction and levee removal activities will be limited to before and after the spring runoff period when river levels are low.
- 5) Areas disturbed during construction will be revegetated with appropriate plant species (i.e. willows, grasses).
- 6) A seep collection systems will be installed to collect the major source of irrigation runoff. The Service would monitor selenium levels in the bottomland ponds and wetlands after construction to determine if additional management actions are necessary. If selenium levels are elevated, the Recovery Program would take appropriate management action.
- 7) Cultural and historical sites eligible for listing in National Register of Historical Places will be avoided. Sites will be fenced during construction to avoid disturbance.
- 8) Construction activities will be stopped in the event that cultural resources or threatened and endangered species are encountered. Construction activities will not resume until additional appropriate consultation and additional protective measure are implemented.
- 9) If any unexpected problems occur that are directly attributable to the notch in the levee, the Recovery Program will take the appropriate corrective action.

---

## CHAPTER 4 – CONSULTATION AND COORDINATION

---

### **General**

Reclamation and the Service conducted internal scoping to identify issues and concerns associated with the proposed action. The owners of Thunder Ranch participated in the development of the proposed action and development of the acquired easement. Stipulations in the easement are considered environmental commitments and were incorporated into the Final EA.

A Draft EA was distributed to interested parties for comment and review on December 31, 2003. Reclamation requested written comments by January 26, 2004. A total of four comment letters were received include two letters from Uintah County, one from the U.S. Fish and Wildlife Service-Utah Ecological Services Office, and one from the U.S. Fish and Wildlife Service-Ouray National Wildlife Refuge. Each comment was addressed in the Final EA and comments and responses are presented in Appendix C.

Reclamation staff continues to informally coordinate and consult with Uintah County, the Recovery Program, U.S. Fish and Wildlife Service, Utah Division of Wildlife, and the U.S. Army Corps of Engineers, as well as the owners of Thunder Ranch. A complete list of agencies, organizations, and individuals is included in the Distribution List.

### **Distribution List**

Appendix A contains the mailing list for this draft EA. The list includes all individuals, agencies, and organizations that may have an interest in the proposed action. This draft EA will be made available for public comment and any comments, issues or concerns identified during the public comment period will be addressed in the Final EA. In addition, others who specifically provided written comments or request a copy of the draft EA will receive a copy of the Final EA.

---

## REFERENCES

- Armbruster, D. M. 1990. *Characterization of Habitat Use by Whooping Cranes During Migration*. U.S. Fish and Wildlife Service Biological Report 90(4).
- Bestgen, K. and L.W. Crist. 2000. Response of the Green River fish community to construction and re-regulation of Flaming Gorge Dam, 1962-1996. Final Report of Colorado State University Larval Fish Laboratory to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.
- Coyner, J. 1989. Status Check on Reported Historic Populations of *Spiranthes diluvialis*. Memorandum, U.S. Fish and Wildlife Service, Salt Lake City, Utah, 9 pp.
- \_\_\_\_\_. 1990. Population Study *Spiranthes diluvialis*. Report for the Bureau of Land Management. Salt Lake City, Utah, 29 pp.
- DeGraaf, R.M., V.E. Scott, R.H. Hamre, L. Ernst, and S.H. Anderson. 1991. Forest and Rangeland Birds of the United States, Natural History and Habitat Use. *Agriculture Handbook*, 688 pp.
- Department of the Interior, 1997. Middle Green River Basin Study, Stewart Lake Waterfowl Management Area, Final Environmental Assessment. United States Department of the Interior, National Irrigation Water Quality Program.
- Flow Engineering, Inc. 1993. Green River Razorback Sucker Spawning Reach Hydrology Study Near Jensen, Utah. San Antonio, New Mexico.
- Goodrich and Neese. 1986. *Uinta Basin Flora*. U.S. Forest Service Intermountain Region, Ogden, Utah, 320 pp.
- Hamilton, S.J. 1995. Hazard Assessment of Inorganics to Three Endangered Fish in the Green River, Utah. *Ecotoxicology and Environmental Safety*, 30;134-142.
- Holden, P. B., and C.B. Stalnaker. 1975. Distribution and Abundance of Mainstem Fishes of the Middle and Upper Colorado River Basins, 1967-73. *Transactions of the American Fisheries Society*, vol. 104, pp. 217-231.
- Inslee, T.D. 1981. Culture of endangered Colorado River Fishes, Section III: spawning of razorback suckers. Pages 145-157 in Colorado River Fishery Project, Final Report, Part 3: Contracted Studies. U.S. Fish and Wildlife Service, Salt Lake City, Utah.
- Jennings, W.F. 1990. Final Report. Species studied: *Spiranthes diluvialis*, *Sisyrinchium pallidum*. Report for the Nature Conservancy. Boulder, Colorado, 29 pp.

---

Jordan, D.S. and B.W. Evermann. 1896. The Fishes of North and Middle America. Bulletin of the Natural History Museum, vol. 47, no. 1, pp. 1240.

Kaeding, L.R., and M.A. Zimmerman. 1983. Life History and Ecology of the Humpback Chub in the Little Colorado and Colorado Rivers of the Grand Canyon. *Transactions of the American Fisheries Society*, vol. 112, pp. 577-594.

Kaeding, L.R., B.D. Burdick, P.A. Schrader, and C.W. McAda. 1990. Temporal and spatial relations between the spawning of humpback chub and roundtail chub in the Upper Colorado River. *Transactions of the American Fisheries Society*, vol. 119, pp. 135-144.

Karp, C.A. and H.M. Tyus. 1990. Humpback Chub *Gila cyhpa* in the Yampa and Green Rivers with Observations on other Sympatric Fishes. *Great Basin Naturalist*, vol. 50, pp. 257-264.

Lemly, A.D. 1993. Guidelines for Evaluating Selenium Data from Aquatic Monitoring and Assessment Studies. *Environmental Monitoring Assessment*, vol. 28, pp. 83-100.

Maddux, H.R., L.A. Fitzpatrick, and W.R. Norman. 1993. *Colorado River Endangered Fishes Critical Habitat*, Draft Biological Support Document. U.S. Fish and Wildlife Service, Salt Lake City, Utah.

McAda, C.W. and R.S. Wydoski. 1980. The razorback sucker, *Xyrauchen texanus*, in the Upper Colorado River Basin, 1974-1976. Technical Papers of the U.S. Fish and Wildlife Service 99. U.S. Fish and Wildlife Service, Washington, D.C.

Minckley, W.L. 1973. *Fishes of Arizona*. Arizona Game and Fish Department, Phoenix, Arizona, 293 pp.

Minckley, W.L. 1983. Status of razorback sucker, *Xyrauchen texanus* (Abbott), in the Lower Colorado River Basin. *Southwestern Naturalist* 28:165-187.

Minckley, W.L., P.C. Marsh, J.E. Brooks, J.E. Johnson, and B.L. Jensen. 1991. "Management Toward Recovery of Razorback Sucker *Xyrauchen texanus*." *In Battle Against Extinction*, W.L. Minckley and J.E. Deacon (eds), University of Arizona Press, Tucson, Arizona, pp. 303-357.

Nesler, T.P., K. Christopherson, J.M. Hudson, C.W. McAda, F. Pfeifer, and T.E. Czapla. 2003. An Intergrated Stocking Plan for Razorback Sucker, Bonytail, and Colorado Pikeminnow for the Upper Colorado River Endangered Fish Recovery Program, Addendum to State Stocking Plans.

Modde, T. and D.B. Irving. 1998. Use of multiple spawning sites and seasonal movements by razorback sucker in the middle Green River, Utah. *North American Journal of Fisheries Management* 18:318-326.

---

Modde, T. and E.J. Wick. 1997. Investigations of razorback sucker distribution movements and habitats used during spring in the Green River, Utah. Final Report to the U.S. Fish and Wildlife Service, Vernal, Utah, to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Ohmart, R.D. and R.J. Sell. 1980. *The Bald Eagle of the Southwest with Special Emphasis on the Breeding Population in Arizona*. Contract No. BR-14-06-300-2674, U.S. Department of the Interior, Water and Power Resources Services.

Paulin, K., H. M. Tyus, and C. Williams. 1990. *Response of Young Colorado Squawfish and Razorback Suckers to Water Flow and Light Intensity*. Unpublished Report, U.S. Fish and Wildlife Service, Vernal, Utah.

Perlich, P.S. 2003 Uintah County: Profile and Data Book, Sept. 2003.

Pettijohn, F.J. 1957. *Sedimentary Rocks*, 2<sup>nd</sup> edition. Harper, New York, 718 pp.

Parrish, J.R., F.P. Howe, and R.E. Norvell. 1999. Utah Partners in Flight draft conservation strategy. UDWR publication number 99-40. Utah Partners in Flight Program. Utah Division of Wildlife Resources, Salt Lake City, Utah.

Riedel, L. 1992. *Hog Canyon Riparian Rehabilitation Project Baseline Data Collection: 1991 Dinosaur National Monument*. Report for the National Park Service, 57 pp.

Roehm, G. W. 2003. A management plan for endangered fishes in the Yampa River Basin and Environmental Assessment. U.S. Fish and Wildlife Service, Prairie-Mountain Region. Denver.

Stephens, D.W., B. Waddell, and J. B. Miller. 1988. *Reconnaissance Investigation of water quality, Bottom Sediments, and Biota Associated with Irrigation Drainage in the Middle Green River Basin, Utah, 1986-87*. U.S. Geological Survey Water-Resources Investigation Report 88-4011, Salt Lake City, Utah, 70 pp.

Stephens, D.W., B. Waddell, L.A. Peltz and J.B. Miller. 1992. Detailed study of selenium and selected elements in water, bottom sediments, and biota associated with irrigation drainage in the Middle Green River Basin, Utah, 1988-1990. U.S. Geological Survey, Water Resources Investigation Report 92-4084. 164 pp. Salt Lake City, Utah.

Stone, R.D. 1993. Final Report for the 1992 Challenge Cost Share Project, Uinta and Wasatch-Cache National Forests, Target Species: Ute ladies'-tresses orchid *Spiranthes diluvialis* Sheviak (Orchidaceae). Utah Natural Heritage Program, Salt Lake City, Utah, 27 pp.

Tetra Tech Inc., 2003. Memorandum from Jason Carey to Recovery Program regarding restoration alternatives dated February 6, 2003.



---

Tyus, H.M. 1990. Potamodromy and Reproduction of Colorado Squawfish (*Ptychocheilus lucius*). *Transactions of the American Fisheries Society*, vol. 119, No. 1, pp. 035-1047.

Tyus, H.M. and C.A. Karp. 1990. Spawning and movements of razorback sucker, *Xyrauchen texanus*, in the Green River Basin of Colorado and Utah. *Southwestern Naturalist* 35:427-433.

Tyus, H.M. and G.B. Haines. 1991. Distribution, Habitat Use, and Growth of Age-0 Colorado Squawfish in the Green River Basin, Colorado and Utah. *Transactions of the American Fisheries Society*, vol. 120, No. 1, pp. 9-89.

U.S. Fish and Wildlife Service. 1990. *Bonytail Chub Recovery Plan*. Prepared by Colorado River Fishes Recovery Team for U.S. Fish and Wildlife Service, Denver, Colorado, 35 pp.

\_\_\_\_\_. 1990b. *Humpback Chub Recovery Plan*. Prepared by Colorado River Fishes Recovery Team for U.S. Fish and Wildlife Service, Denver, Colorado, 43 pp.

\_\_\_\_\_. 1991a. *Colorado Squawfish Recovery Plan*. Prepared by Colorado River Fishes Recovery Team for U.S. Fish and Wildlife Service, Denver, Colorado, 56 pp.

\_\_\_\_\_. 1994a. *Ouray National Wildlife Refuge Bird List*. Vernal, Utah.

\_\_\_\_\_. 1994b. Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for the Colorado River Endangered Fishes: Razorback Sucker, Colorado Squawfish, Humpback Chub, and Bonytail Chub. 50 CFR Part 17, RIN 1018-AB91, Federal Register, Vol. 59, No. 54, pp. 13374-13401.

\_\_\_\_\_. 1995. *Ute Ladies'-tresses Orchid Biology, Life History and Ecology*. Salt Lake City, Utah, 19 pp.

\_\_\_\_\_. 2001. Memorandum to Bruce Waddell from Nathan Darnall dated June 26, 2001. U.S. Fish and Wildlife Service, Salt Lake City, Utah.

\_\_\_\_\_. 2002a. Razorback sucker (*Xyrauchen texanus*) Recovery Goals: amendment and supplement to the Razorback Sucker Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

\_\_\_\_\_. 2002b. Colorado Pikeminnow (*Ptychocheilus lucius*) Recovery Goals: amendment and supplement to the Colorado Squawfish Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

---

\_\_\_\_\_. 2002c. Humpback Chub (*Gila cypha*) Recovery Goals: amendment and supplement to the Humpback Chub Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

\_\_\_\_\_. 2002d. Bonytail (*Gila elegans*) Recovery Goals: amendment and supplement to the Bonytail Chub Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

U.S. Forest Service, National Park Service, Bureau of Land Management, Utah Natural Heritage Program, U.S. Fish and Wildlife Service, Environmental Protection Agency, Navajo Nation, and Skull Valley Goshute Tribe. 1991. *Utah Endangered, Threatened, and Sensitive Field Guide*. Ogden, Utah.

Vanicek, C.D. 1967. *Ecological Studies of Native Green River Fishes below Flaming Gorge Dam, 1964-1966*. Dissertation, Utah State University, Logan, Utah, 124 pp.

Vanicek, C. D. and R.H. Kramer. 1969. Life History of the Colorado Squawfish, *Ptychocheilus lucius* and the Colorado Chub, *Gila robusta* in the Green River in Dinosaur National Monument, 1964-1966. *Transactions of the American Fisheries Society*, vol. 98, No. 2, pp. 193-208.

Waddell, B.W. 2001. Summary of Observations from 9/5/2001 at Thunder Ranch, formerly Escalante Ranch, Utah, U.S. Fish and Wildlife Service unpublished report.

Waddell, B.W. and C. Wiens. 1994. *Contaminant Assessment of Winter Storage Pond, Lower Ashley Creek, and Lower Brush Creek, Utah, 1991*. Final Draft Report, U.S. Fish and Wildlife Service, Salt Lake City, Utah

Welsh, S.L. 1979. *Illustrated Manual of Proposed Endangered and Threatened Plants of Utah*. Submitted to U.S. Fish and Wildlife Service, Denver, Colorado.

Welsh, S.L. N.D. Atwood, S. Goodrich, and L.C. Higgins. 1993. *A Utah Flora*. Brigham Young University, Provo, Utah, 986 pp.

Wick, E.J. 1997. Physical processes and habitat critical to the endangered razorback sucker on the Green River, Utah. Doctoral Dissertation. Colorado State University, Fort Collins.

Wick, E.J. and J.A. Hawkins. 1989. *Observations on the Use of the Little Snake River in Colorado by Endangered Colorado Squawfish and Humpback Chub, 1988*. Larval Fish Laboratory, Colorado State University, Fort Collins, Colorado, 10 pp.

---

## **APPENDIX A-Distribution Mailing List**



---

**Mike Walters  
Thunder Ranch LLC  
101 Long Road  
Lenoir City, TN 37772**

**Uintah County Commissioners  
152 East 100 North  
Vernal, UT 84078**

**Hatch, Orrin G., Senator  
8402 Federal Office Building  
125 South State Street  
Salt Lake City, UT 84138**

**Cannon, Chris - Congressman  
51 S. University Ave, Suite 317  
Provo, UT 84606**

**Matheson, James D., Congressman  
240 East Morris Ave., Suite #235  
South Salt Lake, UT 84115**

**Ouray National NWR  
HC69 Box 232  
19001 East Wildlife Refuge Rd.  
Randlett, UT 84063**

**Brown's Park NWR  
1381 Highway 318  
Maybell, CO 81640**

**Bennett, Bob – Senator  
431 Dirksen Building  
Washington, D.C. 20510-4403**

**RC & D  
240 West Highway 40  
Roosevelt, UT 84066**

**Bureau of Indian Affairs  
P.O. Box 130  
Fort Duchesne, UT 84026**

**Dinosaur National Monument  
4545 Highway 40  
Dinosaur, CO 81610**

**Bureau of Reclamation  
302 East 1869 South  
Provo, UT 84606-6154**

**Uintah County Mosquito Abatement  
1425 East 1000 South  
Vernal, UT 84078**

**Ute Indian Tribe Fish & Wildlife  
Department  
P.O. Box 190  
Ft. Duchesne, UT 84026**

**Bear River NWR  
58 South 950 West  
Brigham City, UT 84302**

**U.S. Forest Service  
355 North Vernal Avenue  
Vernal, UT 84068**

**NRCS  
80 North 500 West  
Vernal, UT 84078**

**Bureau of Reclamation  
125 South State Street  
Salt Lake City, UT 84138-1102**

**Uintah County Extension Agent  
152 East 100 North  
Vernal, UT 84078**

**Salt Lake City Audubon Society  
549 Cortez  
Salt Lake City, UT 84103**

---

**Fish Springs NWR  
P.O. Box 568  
Dugway, UT 84022**

**Bureau of Land Management  
170 South 500 East  
Vernal, UT 84078**

**Utah Division of Wildlife Resources  
152 East 100 North  
Vernal, UT 84078**

**Uintah Mountain Club  
P.O. Box 782  
Vernal, UT 84078**

**Robert Muth  
Upper Colorado River Basin Endangered  
Fishes Recovery Program  
U.S. Fish and Wildlife Service  
Box 25486, DFC  
Denver, Colorado 80225**

**Pat Nelson  
Upper Colorado River Basin Endangered  
Fishes Recovery Program  
U.S. Fish and Wildlife Service  
Box 25486, DFC  
Denver, Colorado 80225**

**Tom Pitts  
Water Consult  
535 North Garfield Ave.  
Loveland, CO 80537-5548**

**Clayton Palmer  
Western Area Power Administration  
257 E. 200 S., Suite 475  
Salt Lake City, UT 84111**

**Leslie James  
Colorado River Energy  
Distributors Association  
1600 W. Broadway Rd., Suite 111  
Tempe, AZ 85282**

**Frank Pfiefer  
Colorado River Fisheries Project  
U.S. Fish and Wildlife Service  
380 South 2350 West  
Vernal, UT 84078  
435-789-0351**

**Henry Maddux  
Utah Ecological Service Field Office  
U.S. Fish and Wildlife Service  
2369 West Orton Circle  
West Valley City, Utah 84119**

**Moon Lake Electric Association  
188 West 200 North  
Roosevelt, UT 84066**

**Mid-American Pipeline Company  
Vernal, UT 84078**

**Questar Pipeline Company  
61 East 1700 South  
Vernal, UT 84078**

**Chevron Inc. and Chevron Pipeline  
Company  
Roosevelt, UT 84066**

**Williams Gas Pipeline-West - Northwest  
Pipeline Corporation  
599 South 500 East, Vernal, UT 84078**



## **APPENDIX B**

### **Thunder Ranch Bottomland Aerial Photo Site Plan**









---

## **APPENDIX C**

### **Comment Letters and Responses on the Draft EA**

---

## January 21, 2004 Comment Letter from Uintah County Commission

**Comment 1.** Procedural Issues: Congress recognized the responsibility of local governments to be involved in decisions affecting their citizens and under the provisions of the Federal Land Management and Policy Act (FLPMA) and National Environmental Protection Act (NEPA), Uintah County should have been involved with the development of this project and been included as a cooperating agency. It is unfortunate that the County was not given an opportunity to be a cooperator in the preparation of the document from the beginning. The County has land management expertise and authority over lands within and around the project and has responsibility for the safety and health of the County residents.

**Response 1.** *The Upper Colorado River Basin Endangered Fishes Recovery Program is a joint cooperative of the States of Utah, Colorado and Wyoming, the Secretary of the Interior, the Administrator of the Western Area Power Administration, water users, and environmental groups. The Recovery Program identified a need for floodplain habitat restoration along the Green River on the Thunder Ranch near Jensen, Utah to assist in recovery efforts for the endangered Colorado River fishes. The Recovery Program requested Reclamation acquire easements for bottomland restoration. Once the easement was obtained, the Recovery Program develop the proposed action and requested Reclamation to ensure NEPA compliance as well as other applicable Federal and State laws (i.e. Endangered Species Act, Clean Water Act, Historic Preservation Act). As defined in the Federal Land Policy Management Act of 1976 (FLPMA), public lands include only those lands administered by the Bureau of Land Management (with the exception of lands located on the Outer Continental Shelf and lands held for the benefit of Indians, Aleuts, and Eskimos). Therefore FLPMA does not apply to the proposed action. However, under NEPA, Reclamation determined that an environmental assessment (EA) was the appropriate NEPA document to assess potential impacts associated with the proposed action. A draft EA was distributed to interested parties including the Uintah County Commission for review and comment. Requesting Uintah County's comments on the draft document supports Uintah County's land management expertise and authority over lands within and around the project and Uintah County's responsibility for the safety and health of the County Residents. Reclamation supports and appreciates the County's assistance, comments and review.*

*Through this process, Reclamation has attempted to address Uintah County's issues and concerns regarding the proposed action.*

**Comment 2.** The EA ignores Uintah County's General Plan. No where has the document provided consistency review with respect to the Uintah County Plan.

**Response 2.** *After receiving this comment, Reclamation requested a copy of the Uintah County Plan. The Uintah County Planning Office provided copies of two sections of the County Plan for review. These included 1) Public Lands—County Policy-Public Lands and 2) Public Lands Implementation Plan. The Public Lands portion of the Uintah County's General Plan reflects*

---

*Uintah County's position on the management and use of public lands that impact the County's interests. The Plan clearly and concisely states County policies, issues and objectives and that this document will be used by the County and federal and state public land management agencies during public land planning efforts and decision-making processes. Thunder Ranch is privately owned and the provisions included in these two documents do not apply. Nevertheless, Reclamation is committed to ensuring compliance with all applicable County, State and Federal laws, regulations and policies.*

**Comment 3.** Title Page-Change "Floodplain" to "Floodplain".

**Response 3.** *Changed.*

**Comment 4.** Chapter 2, page 9, Proposed Action, para. 3-The EA fails to establish a base flow to compare flow events against. This information is needed to allow the reader to adequately evaluate the proposed action and its impacts upon other resources.

**Response 4.** *The proposed action will not affect flows in the Green River. The project is designed to reconnect the Thunder Ranch floodplain wetlands with the river. Under existing conditions, Green River flows would have to exceed 30,000 cfs to overtop the man-made levee that had been constructed between the river and the wetlands. After the levee is notched, flows between 12,000 and 16,900 cfs will connect the river to the wetlands. Clarification has been added to Final EA.*

**Comment 5.** Page 9. Proposed Action, Para 4, 2<sup>nd</sup> sentence-"Natural" vegetation is unclear. If this is native vegetation then the word needs to be changed. If this isn't native vegetation then a definition is needed for clarity.

**Response 5.** *It was intended to mean native vegetation. The word has been changed.*

**Comment 6.** Page 10. Para 1 "A Majority of the seeps"-Much of the document discusses the issues related to decreasing selenium in the project area and the effects of selenium upon the project and the Green River. Unclear, however, is whether or not the Bureau of Reclamation is prepared to accept the risk involved with selenium levels from adjacent land activities. It is Uintah County's position that if the proposed project is approved, the Bureau of Reclamation has accepted the risk of increased selenium from land activities on adjacent lands and cannot force the landowners to adjust or change their management of those lands due to increased selenium levels in runoff or seepage water.

**Response 6.** *The risk was accepted upon acquisition of a perpetual easement by the federal government. The project area is entirely contained within the Thunder Ranch property boundaries. The ranch owner and managers have been very cooperative and have, in fact, altered irrigation practices voluntarily to reduce levels of selenium. They are, however, under no obligation to do so.*

---

**Comment 7.** Page 10. Para 2. Last sentence “The project area...”-This sentence appears to contradict the statement made on Page 14, Para. 3. “Hunting and recreation access would continue to be controlled by Thunder Ranch...” Clarification is needed as to whether or not hunting will be allowed on the proposed project lands.

**Response 7.** *Thunder Ranch is a privately-owned property. The federal government did not purchase the right to open the area to the public for hunting and recreation. Terms of the easement contract leave it up to the owner of Thunder Ranch regarding public access. Clarification has been added.*

**Comment 8.** Chapter 3. General. Page 12. Para 3.-The EA inaccurately describes the major industries within Uintah County today. A recent economic study (Uintah County: Profile and Data Book, P.S. Perlich, Sept. 2003) was completed at Uintah County’s request. The top five industries within Uintah County in descending order were Service (25.8%), Retail (17.2%), Government (15.3%), Mining (11.8%), and Farming and Agriculture Services (8.2%). It is important to note that Service industries support the other industries. Bill Johnson, Economic Development, has copies of the economic study by Perlich, 2003, and can be contacted at (435) 781-6731.

**Response 8.** *The paragraph has been revised to reflect the updated information.*

**Comment 9.** Chapter 3. Land Use and Recreation Page 13. Para 2. Line 6 “Springs and seeps...”-The EA acknowledges that the springs and seeps contribute to the ponds and wetlands. The EA fails to adequately address where the water will come from to replace the water from these seeps and springs that will be piped directly to the Green River to reduce selenium levels within the project area. Include where this water will come from and the related impacts.

**Response 9.** *Thunder Ranch pumps water from the Green River to irrigate fields on the upland terrace above the bottomlands. Most of the seep water results from percolation of irrigation water. The plan is collect seep water from a 100-foot section of the bluff. Seeps from the bluff extend over several thousand feet, and it is not anticipated that the small amount of water collected will measurably affect the amount of water going into the wetlands. In addition, dry wells with freshening channels will be constructed to provide replacement water to the wetlands. Ultimately, water which was pumped from the Green River will go back into the river.*

**Comment 10.** Chapter 3. Page 14, Para 1. Access-The maps included in the EA shows a road and this paragraph discusses access but the EA fails to analyze the impact of the project upon access and the road. Continued access to these lands and roads is essential. The proposed action could affect the road base and deny access to recreationists, hunters, and weed and mosquito abatement crews. The status of the existing roads and rights of way at the completion of the project should be contained in this document.

---

**Response 10.** *The roads are located within Thunder Ranch property boundaries. Thunder Ranch is a privately-owned property, and anyone seeking access will need permission from the landowner. The easement contract allows for access for project construction and maintenance, and coordination with owner and managers of Thunder Ranch will ensure that project activities do not interfere with ranch operations. Clarification was added.*

**Comment 11.** Chapter 3. Page 14, Riparian Community-Greasewood is not a riparian plant species even though it can indicate a perched, saline water table.

**Response 11.** *It has been found “in the vicinity”, but it probably should not have been included under the riparian community heading. It has been removed from the list.*

**Comment 12.** Chapter 3. Page 14, Bottomland Pond and Wetland Community-As the EA states, “tamarisk and other noxious weeds are not abundant within the bottomland community”, it is clear that the proposed project area is not free of noxious weeds. The EA fails to disclose the noxious weeds currently on the proposed project area which needs to be included in this document. Species of particular concern would include, but not be limited to:

Whitetop (*Cardaria spp.*)  
Reed canary grass (*Phalaris arundinaceae*)  
Purple loosestrife (*Lythrum salicaria*)  
Knapweed (*Centaurea spp.*)  
Perennial pepperweed (*lepidium latifolium*)  
Canada thistle (*Cirsium arvense*), and  
Russian olive (*Eleagnus angustifolia*)

**Response 12.** *Pre-project surveys and post-project monitoring will be conducted. If noxious weeds become a problem resulting from project construction and operation, the Recovery Program will work with the Uintah County weed managers and the owner and managers of Thunder Ranch to address the situation.*

**Comment 13.** Chapter 3. Page 15, Proposed Action, Para 1, Last 2 sentences, “One possible negative...”-The EA states the proposed action could provide for the spread of noxious weeds but only provides for a weed control program if it “is necessary”. No indication was given as to the condition that would trigger the implementation of a weed control program. As has been evidenced across the West, noxious weeds should be treated as an out-of-control wildfire. It is Uintah County’s position that no population of noxious weeds should be left uncontrolled.

**Response 13.** *The Recovery Program will work with the Uintah County weed managers and the owner and managers of Thunder Ranch to address the situation. It should be noted that the easement contract states that the Grantor requires permission from the Secretary of Interior (or his authorized representative) prior to utilizing (weed control) methods that may harm the endangered fishes.*

---

**Comment 14.** Page 30, Selenium Levels, Para 2, Last sentence, “The major concern...”-The EA admits that there is limited data from the proposed project area, however, it is unclear whether or not the Bureau of Reclamation is prepared to accept the risk involved with selenium levels from adjacent land activities. It is Uintah County’s position that if the proposed project is approved, that the Bureau of Reclamation has accepted the risk of increased selenium from land activities on adjacent lands and cannot force the landowners to adjust or change their management of those lands due to increased selenium levels in runoff or seepage water. In addition, Uintah County would not approve the Bureau of Reclamation acquiring instream-flow water to flush the proposed project lands.

**Response 14.** *It is not anticipated that selenium levels will increase as a result of adjacent-land activities. The project area is entirely contained within the Thunder Ranch property boundaries. The ranch owner and managers have been very cooperative and have, in fact, altered irrigation practices voluntarily to reduce levels of selenium. They are, however, under no obligation to do so. Acquiring instream flow water to flush the proposed project lands is not included in the proposed action and the Recovery Program has no plans to acquire instream flow water for this purpose.*

**Comment 15.** Page 33, Proposed Action, Para 1, Last sentence “The Green River would dilute...”-The EA fails to discuss the impact of increased selenium entering the Green River on the Colorado River Salinity Programs.

**Response 15.** *The National Irrigation Water Quality Program (NIWQP), under the direction of the Bureau of Reclamation, has used this approach to address selenium in other parts of the Colorado River Basin. The Bureau of Reclamation is a partner in this project and is also responsible for implementation of the Colorado River Salinity Mitigation Program. The impacts to the Colorado River Salinity Programs are predicted to be immeasurable.*

**Comment 16.** Page 34, Health and Safety/Disease Vectors-The EA significantly fails to address the issues of mosquito and biting fly control. Millions of mosquitoes can be hatched per acre. Gnats and other biting flies and insects abound within the proposed project area. Four specific diseases present within the project area that have been and will be of serious economic and social concern are the West Nile Virus, Western Equine Encephalitis, St. Louise Encephalitis, and Blue Tongue. These diseases can be carried by the mosquito and fly vectors up to 20 miles from point of origin in a single generation. The statement that the Recovery Program would work with landowners “to address the issue if it arises” is simplistic and naïve. The problem already exists and must be addressed within this EA.

Dr. Steve Romney of Uintah Mosquito Abatement is an expert in the entomology and control of mosquitoes. It is critical that the Recovery Program cooperation and coordination with the Uintah Mosquito Abatement for mosquito control. An active mosquito control program must be include both larvicidal and adulticidal programs. The EA needs to include the control agents



---

(chemical and biological), application methods (hand, boat, truck, aerial), logistics for access, and permitting processes.

**Response 16.** *Thunder Ranch is privately-owned. If mosquitoes increase as a result of project construction and operation, the Recovery Program will work with the owner and managers of Thunder Ranch and the Uintah County Mosquito Abatement District to address the issue. It is anticipated that mosquito production will not increase, and may actually decrease because standing water will be replaced by flowing water during the spring runoff. It should be noted that the easement contract states that the Grantor requires permission from the Secretary of Interior (or his authorized representative) prior to utilizing (mosquito control) methods that may harm the endangered fishes. Dr. Romney was contacted and Thunder Ranch has been included in mosquito control treatments in the past by the Uintah County Mosquito Abatement District. Aerial applications of BTI larvacide has been used previously used in the project area. Additional information was added to this section in the Final EA.*

**Response 16.** Page 34, Socioeconomic-The EA fails to address the indirect impacts to the Thunder Ranch, surrounding landowners, and adjacent communities from mosquito and noxious weeds.

**Comment 16.** *No direct or indirect impacts are anticipated as a result of the project.*

## **January 14, 2004 Comment Letter from Dan Alanso, USFWS, Ouray National Wildlife Refuge**

**Comment 1.** Chapter 3 Affected Environment, Page 15 Proposed Action (first paragraph) “The proposed action is predicted to have no affect on the riparian community along the Green River”- You may want to change this statement to will have a beneficial affect on the riparian community based on evidence at levee removal sites at Ouray National NWR. The present cottonwood and willow will more than likely expand as will tamarisk and perennial pepperweed. The native vegetation should out-compete the non-native vegetation with the proposed flood frequency and duration.

**Response 2.** *Similar results have occurred elsewhere. Pre-project surveys and post-project monitoring will be conducted. If noxious weeds become a problem resulting from project construction and operation, the Recovery Program will work with the Uintah County weed managers and the owner and managers of Thunder Ranch to address the situation.*

**Comment 2.** Page 10 Proposed Action (last paragraph, fourth line)-The Ranch is referred to as the Thunder Mountain Ranch and should be referred to as such throughout the document. If I am not mistaken, the name of the Ranch is “Thunder Mountain Ranch” not Thunder Ranch.

**Response 2.** *A business card for Shayne McKee, General Manager, has “Thunder Ranch”.*

---

**Comment 3.** Chapter 3, Page 17 Avian Species (second paragraph, line nine)-Blue geese are not a separate species, they are snow geese. You might want to correct it by simply striking “and blue geese”.

**Response 3.** *Corrected.*

**Comment 4.** There is no mention of mosquitoes which is a very contentious subject associated with river levee breaches. You may want to add mosquitoes to the document and how they stand to be affected. You may want to contact Dr. Steven Romney, Uintah County Mosquito Abatement District for assistance.

**Response 4.** *Dr. Romney was contacted and the results of that discussion are included in the Final EA. If mosquitoes increase as a result of the project construction and operation, the Recovery Program will work with the owner and managers of Thunder Ranch and the Uintah County Mosquito Abatement District to address the issue. It is anticipated that mosquito production will not increase, and may actually decrease because standing water will be replaced by flowing water during spring runoff. It should be noted that the easement contract states the Grantor requires permission from the Secretary of Interior (or his authorized representative) prior to utilizing (mosquito-control) methods that may harm endangered fishes.*

**Comment 5.** Chapter 3, Page 13-I highly recommend obtaining, if not already done, written statements from the nine utility and pipeline easement holders that they are in agreement with the proposed action. I can see this being a deal breaker as far as the Refuge System accepting the transfer of this easement from the Bureau.

**Response 5.** *All easement holders received copies of the draft EA. No comments have been received. Follow-up Telephone and personal contacts will be made prior to project construction.*

**Comment 6.** Chapter 3, Page 26 (second to last paragraph)-Typographical error: “The presents of absent of western yellow-billed cuckoo...”. Change to presence or absence of ...

**Response 6.** *The typo was corrected in the Final EA.*

## **February 3, 2004 Comment Letter from Henry Maddux, USFWS, Utah Field Supervisor**

**Comment 1.** Uncertainties and contingent actions will be address through Adaptive Management. The Adaptive Management approach could be addressed early in the document as it would then allow for discussion of uncertainties and resultant contingent actions that will result. Monitoring of the effects on fish as well as monitoring of selenium and other water quality issues also needs to be addressed more fully as they describe how the effects on the

---

endangered fish will be discovered, refine what options exist to solve problems as they arise, and who will be responsible for the time and costs incurred.

**Response 1.** *To determine if the habitat functions as planned, the Recovery Program intends to monitor and evaluate the project after construction. Operations will be modified , if necessary, by the Recovery Program and the U.S. Fish and Wildlife Service.*

*Evaluation will consist of stocking hatchery-produced larval razorback sucker and bonytail into the wetlands, and monitoring survival and growth. Dissolved oxygen, pH, and temperature will be recorded hourly through a 24-hour period every week with a continuous recording device (hydrolab). In addition, recording thermometers will be installed. Turbidity will be measured once a week at the time hydrolab recorders begin recording, and depth will be monitored weekly. If water quality degrades in any impoundment, the hydrolab will be deployed in that site to document severe changes for correlation in the event of an eventual fish-kill. If the wetlands begin to dry up such that water quality becomes a threat to survival of razorback sucker and bonytail, attempts will be made to capture fish and either stock them directly into the Green River or into available grow-out ponds (as determined by the Biology Committee of the Recovery Program).*

*Wetland vegetation will be monitored monthly with aerial photography. Total area of the wetland will be determined using GPS equipment and percent area of dominant vegetation will be determined by planimetry. Dominant vegetation types will be identified (i.e., dominant submergent, emergent, flooded terrestrial, etc.) and the percent area from overhead aerial photographs will be determined.*

*Fish composition and size structure (length frequency) will be monitored in each wetland shortly after initial inundation to determine relative abundance and composition of nonnatives; in mid-summer to determine the relative abundance or absence of stocked fishes; and in late September or early October to determine abundance of stocked fish and fish species composition in the wetland preceding the winter months. Each fish collection will consist of five fyke nets set overnight at randomly assigned shoreline sites. Species, weight, and length (TL) of all fish captured will be recorded. During the last fish collection, mark-recapture efforts will be attempted in each wetland to determine the absolute abundance of razorback sucker and bonytail at the end of the first field season (sampling not to exceed five net nights). Relative abundance of non-stocked fish will be determined in the fall.*

*Data will be analyzed to determine how nonnative fish abundance and composition, temperature, dissolved oxygen, pH, turbidity, depth, size of wetland, type and vegetation cover are associated with survival of both razorback sucker and bonytail in the wetlands studied. Razorback sucker and bonytail survival, growth and abundance (absolute and relative) will be regressed with environmental and biological parameters measured to identify causal relationships.*

---

*Monitoring of selenium and other water quality issues will be conducted and funded by the U.S. Fish and Wildlife Service to the extent deemed necessary by the Utah-ES office. Data and results of evaluation efforts will be shared between the Recovery Program and the Service.*

**Comment 2.** It was felt that the drainage pipeline details need to be expanded. The outlet of the drainpipe should preferably be downstream of levee breaks to preclude selenium re-entering the backwater during flooding. True, this conflict would only occur during flood flows, but as the backwater opens up, velocities will decrease until no flow occurs when water levels match the adjacent river. Selenium bio-removal would be similar to that without the drainpipe except the frequency of flooding is being increased substantially. The outlet should also be in an area that will not be emptying into a backwater at low flows. A discussion of the 100 foot selenium/seep collector pipe relative to which seeps will be collected, and an estimate of the captured versus not captured amount of selenium in the North Pond would be beneficial as it leads to the Adaptive Management contingencies if the remaining uncaptured selenium proves to be a problem.

**Response 2.** *Of the seven levee notches, the engineering design includes two notches that will be downstream of the conveyance pipe outlet. There is a possibility that some of the selenium-laden water could get back into the wetlands during spring runoff. However, the site is not designed to function as a backwater, but as a flow-through (see pages 9 and 10 in the draft EA). There will be sufficient head such that, as flows greater than 12,000 to 16,900 cfs (depending on levee notch invert elevation), river water flow through the notches, then back to the river through the outlet channel. This will only occur during high spring flows which are generally of relatively short duration (e.g. a few days or weeks). In addition, a flap-gate will be installed on the drainpipe outlet to prevent silt buildup in the pipe during spring flooding. When the pressure from the river is greater than pressure in the pipe, no selenium drainage will occur. Once the river flow drops, the flap-gate will open and transport the selenium-laden water to the river. Therefore, it is not expected to be a problem. If the site does not function as planned, corrective action will be taken by the Recovery Program.*

**Comment 3.** A possible issue at this site we are uncertain has been addressed elsewhere is the potential concern for mosquito control to protect human health and livestock. A concern might exist with the public that with more frequent flooding, mosquito populations would be increased. Use of some chemicals could be counter-productive to potential benefits of capturing larval fish and their survival.

**Response 3.** *It is not anticipated that the project will increase the amount of standing water that currently exists on Thunder Ranch. Most of the standing water is a result of percolation and seepage of irrigation water. During spring runoff, while water is flowing through the levee notches and wetlands, mosquito production may actually decrease. Regarding harmful chemicals, the easement contract states that the Grantor requires permission from the Secretary of Interior (or his authorized representative) prior to utilizing (mosquito-control) methods that may harm the endangered fishes.*

---

## March 4, 2004 Comment Letter from Uintah County Commission

**Comment 1.** In our General Plan, Uintah County has tried to not duplicate Utah State Code that mandates the County's responsibilities both on public and private lands. Uintah County does not oppose the proposed action on the Thunder Ranch easement, however, we do have some serious concerns that need to be addressed in the plan development and environmental assessment. The Utah State Code backs our need for an environmental assessment on the issues of mosquitoes and weeds within the proposed project area.

**Response 2.** *Additional analysis was incorporated into the Final EA regarding mosquito and noxious weed control. Reclamation reviewed and discussed the proposed action with Dr. Steven Romney, Uintah Mosquito Abatement District, and Milt Billings, Uintah County Weed Board.*

**Comment 2.** As we mentioned in our comment letter of January 21, 2004, the Thunder Ranch is host to 4 separate diseases carried by mosquitoes – West Nile Virus, Western Equine Encephalitis, St. Louis Encephalitis, and Blue Tongue. Uintah County citizens have suffered financial and physical distress from mosquitoes and biting flies. We are mandated to control mosquitoes, flies, crickets, etc. by Utah State Code.

**Response 2.** *The Recovery Program remains committed to working with the Uintah County Mosquito Abatement District and the owner and managers of Thunder Ranch in regards to mosquito-control to protect health and public safety. Currently the District applies BTI larvacide using an aerial application to properties along the Green River including the Thunder Ranch bottomland site. The District maintains a 200 yard buffer zone along the Green River to protect the river resources. This application will continue as needed under the direction of the District. The use of other control agents would be coordinated between the District, the Service, and the owner and managers of Thunder Ranch. Regarding harmful chemicals, the easement contract states that the Grantor requires permission from the Secretary of Interior (or his authorized representative) prior to utilizing (mosquito-control) methods that may harm the endangered fishes.*

**Comment 3.** As we mentioned in our comment letter of January 21, 2004, the Thunder Ranch is, or may, become host to over 7 different noxious and invasive weed species. Uintah County is actively engaged in working with private landowners, state agencies, and federal agencies to control noxious and invasive weeds throughout the County. We are mandated to control weeds by the Utah State Codes under the Utah Noxious Weed Act. As part of the final environmental assessment for the proposed Floodplain Restoration on the Thunder Ranch a weed management plan and mosquito management plan needs to be addressed.

**Response 3.** *The Recovery Program encourages continued noxious and invasive weed control measures engaged by the Uintah County Weed Board and the owner and managers of Thunder Ranch. The proposed action is predicted to restore a more natural flood frequency which would*

---

*favor native species over noxious and invasive species. The easement would be managed by the National Wildlife Refuge System which has developed a working relationship with the Uintah County Weed Board to address noxious and invasive weeds on Refuge properties. This relationship would continue as the Refuge System assumes management of the Thunder Ranch easement. Pre-project surveys and post-project monitoring will be conducted. If noxious weeds become a problem resulting from project construction and operation, the Recovery Program will work with the Uintah County weed managers and the owner and managers of Thunder Ranch to address the situation.*

**APPENDIX D**

**BIOLOGICAL OPINION**